PSM

Handwritten Note

MBBS Help

http://mbbshelp.com

http://www.youtube.com/mbbshelp

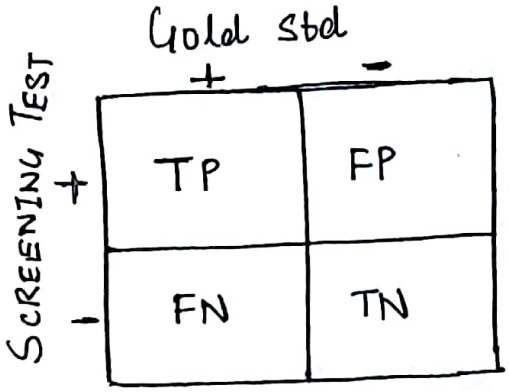
http://www.facebook.com/mbbshelp.com

Name: _____

Subject: **PSM**

SCREENING

5/6/18



2x 2 Table

2 columns x 2 Rows.

DEGREE OF FREEDOM -

factors on a variable depends

$[C-1][R-1]$

eg. 3x4 Table = 6.

FN is more DANGEROUS than FP.

$$\text{SENSITIVITY} = \frac{TP}{TP + FN}$$

$$\text{SPECIFICITY} = \frac{TN}{TN + FP}$$

$$PPV = \frac{TP}{TP + FP}$$

$$NPV = \frac{TN}{TN + FN}$$

→ For a test to be screening Tests, Sensitivity should be High.

→ More sensitivity = Less False Negative

→ Person Labelled as Diseased on the basis of Gold std

→ Sensitivity & Specificity are Column Parallels

→ PPV & NPV are Row Parallels

$S_N \approx TP$ $S_p \approx TN$

Probability

PPV = have Disease NPV = Don't have Disease

PRACTICAL APPROACH TO QUESTIONS OF SCREENING

1> Draw 2×2 table & Label properly

2> Write the total population.

* If Total Population is not given then we most commonly assume it as 100

3> Write the column 1 Total

This can be obtained from 3 Sources

a> those who are +ve ī GS

b> those who are labelled as diseased

c> those who contribute to prevalence

4> Fill the 4 cells & apply the formula.

BAYE'S THEOREM

$$PPV = \frac{S_N \times Prev}{S_N \times prev + (1-S_p)(1-p)}$$

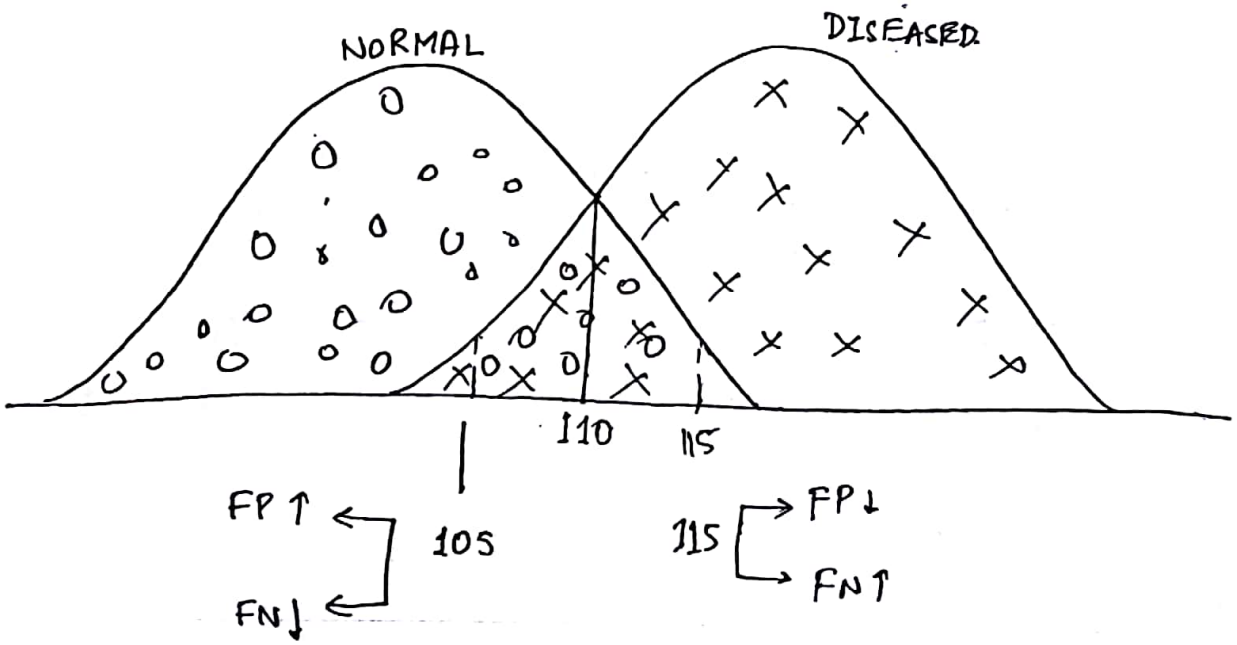
NPV = from CRS.

S.T. = screening Test

G.S. = Gold std.

G.S. \ S.T.	+	−
+	a	b
−	c	d

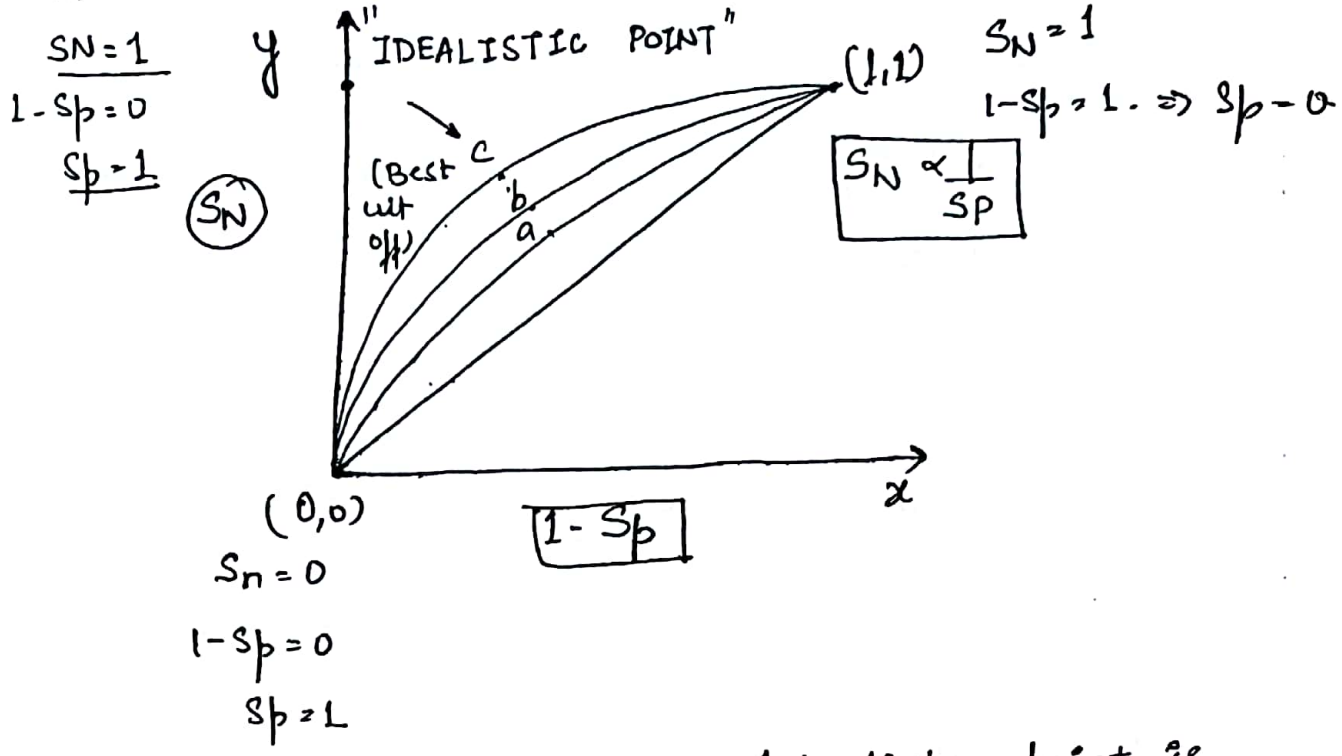
S.T. \ G.S.	+	−
+	a	c
−	b	d



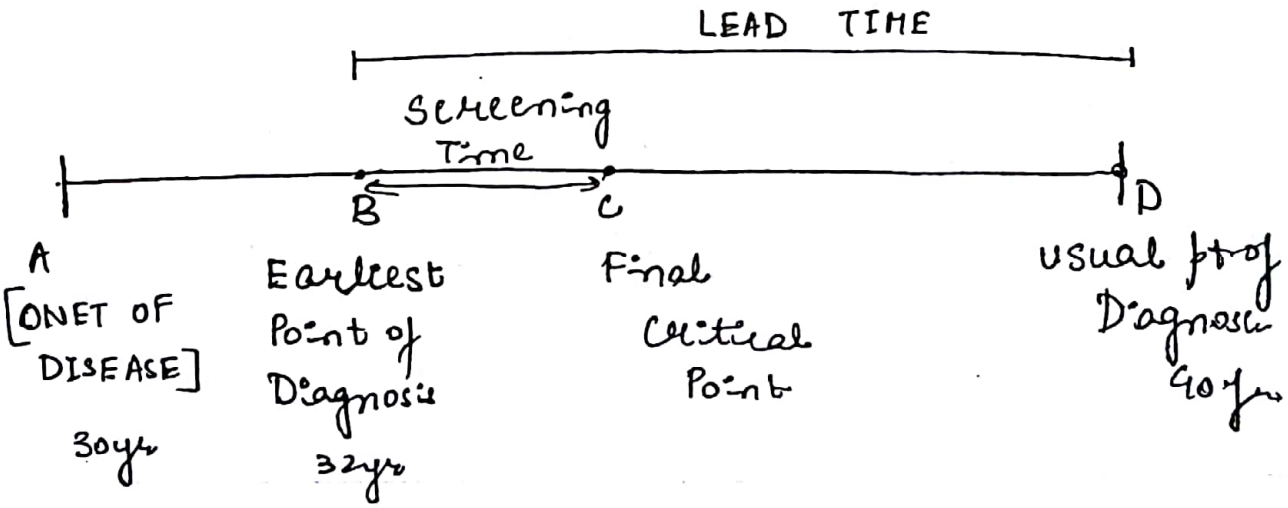
TO DECIDE BEST CUT OFF WE DRAW ROC

RECEIVER OPERATOR CURVE

AIIMS



⇒ Cut off Line Nearest to Idealistic point is "BEST CUT OFF"



Early Diagnosis [B - D]

↕ LEAD TIME

Early Rx → No improvement in Prognosis

Improvement in prognosis (B - C)

Screening Time

Ex. Rabies → No Rx

Pancreatic Cancer → Rapid progression

(LEAD TIME BIAS)

FINAL Critical Point.

↓

Last point after ∠ there is no improvement in Prognosis

ex- golden Time in stroke / CAD

PRINCIPLES OF SCREENING :- WHO

DISEASES	TESTS	Rx
- Imp. Public Health problem - Latent / asymptomatic phase must be tnt	- cost-effective Gold std must be present	cost effective Definitive Rx

Measles, Rubella, Rabies, Tetanus } No Latent / Asymptomatic Phase → No iceberg Phenomenon

↓

No Rx Screening

SCREENING DONE	Ca	NOT DONE
Ca Colon		Ca uterus
Ca Breast		Ca ovary
Ca Cervix		Ca Pancreas
Ca Prostate		Ca Testis
		Ca Brain

Null Hypothesis from Discussion Paper

p value

It refers to chance

p value of 5% or 0.05 means only < 5% of people ~~who~~ were benefitted from the therapy due to chance.

INTERPRETATIONS

1) PREDICTIVE VALUE = Diagnostic Power of a Test

Depend on-

a) Prevalence (max) Not on Incidence

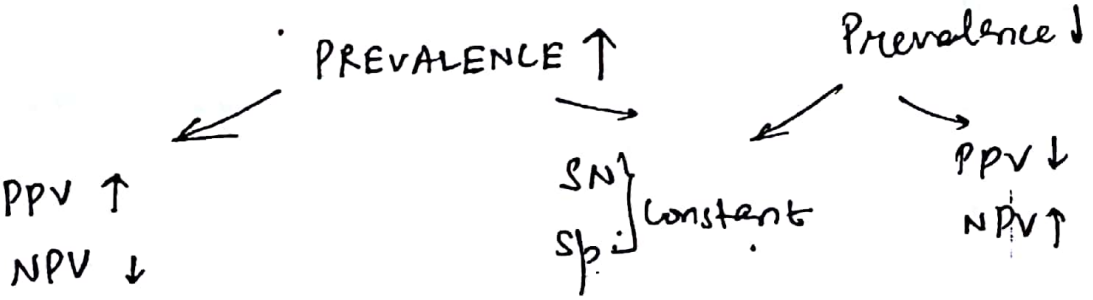
b) $S_N + S_p$

2) PRE TEST PROBABILITY ⇒ Prevalence

3) POST TEST PROBABILITY ⇒ Predictive value.

4) $S_N \propto \frac{1}{S_p}$ $PPV \propto \frac{1}{NPV}$

5.



(5) $SN \uparrow \rightarrow TP \uparrow \rightarrow FP \uparrow$

But reverse doesn't happen.

[FP ↑ → SN ↑ XXX MCQ Book Error
→ Prevalence]

(6) ∴ Screening is always done in High Risk Population.

TEST IN SERIES

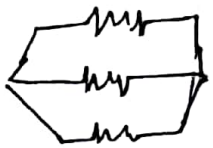
one after other

Ex. Fever + Burning micturition
↓
Urine — Routine
Microscopy
↓ +ve
Urine culture & Sst.

$SN \downarrow$ & PPV ↑ses

Sp ↑ NPV ↓

TEST IN PARALLEL



all at same time

serum
LDL → TG
IDL
VLDL → CHL

Vice-versa in parallel

$SN \uparrow \propto \frac{1}{Sp \downarrow}$ $PPV \downarrow \propto \frac{1}{NPV \uparrow}$

⑦ Concept of Likelihood Ratio & Yield is obselete now.

H.W DIFFERENCE BTW SCREENING & DIAGNOSTIC TEST

TYPES OF SCREENING

TYPES OF SCREENING

PRESCRIPTIVE

1> People screened for own's benefit

2> OBJective ⇒ case control

3> Eg:- Neonatal screening
Pap smear

PROSPECTIVE

1) People screened for other's benefit

2> Disease Control

3> Eg:- Immigrants screening
HIV screening among sex workers

SCREENING TEST

1> High Sensitivity

2> For apparently healthy

3> Based on 1 criteria

4> Relatively cheaper

5> Not sufficient basis for treatment

6> Initiative from investigation

7> Applied to groups

DIAGNOSTIC/GOLD STD TEST

1> High Specificity

2> For persons ± signs & symptoms

3> Based on signs, symptoms & Lab findings

4> Expensive

5> Sufficient basis for t/t

6> Initiative from a person ± complaint

7> Applied to individuals

TOPIC-1

6/6/18

11

MEASURE OF CENTRAL TENDENCY

MEAN (arithmetic)

Add all divided by sample size

~~Geometric~~
~~Harmonic~~

MEDIAN - Arrange in Ascending / Descending value. & middle value is selected

MODE - Most frequently occurring.

Measure of central tendency

NORMAL DISTRIBUTION	NON-NORMAL DISTRIBUTION
Mean = Median = Mode	Mean ≠ Median ≠ Mode
Preferred measure → MEAN	Preferred measure → MEDIAN

OUTLIERS - Any extreme value

Most affected → Mean

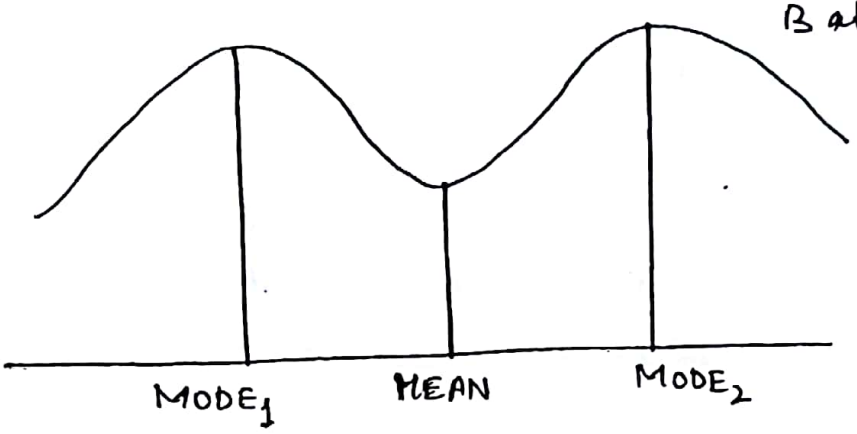
Least affected → Mode (But not preferred as no statistical test can be applied).

Most preferred → MEDIAN

Q TEST-

Statistical Test used to see outliers

BIMODAL → 2 modes



Bath-Tub Distribution

MODE Summary = 3 × MEDIAN − 2 × MEAN

TOPIC-2

MEASURE OF DISPERSION / DEVIATION

FORMULAE :-

1) $SE = \frac{SD}{\sqrt{n}}$ $\qquad SE = \sqrt{\frac{pq}{n}}$.

Quantitative Data. $\qquad$ Qualitative Data

n = sample size

p = prevalence { %age / Proportion.

$q = (1-p)$ or $(100-p)$

3) $COV = \frac{SD}{mean} \times 100$

↓

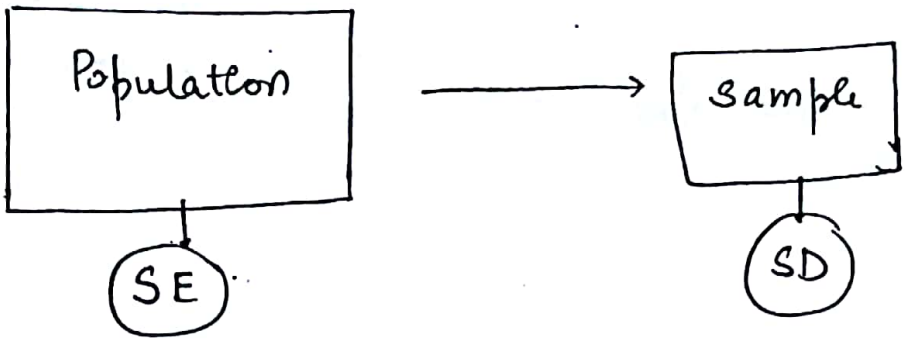
→ Coefficient of variance

→ Unit free measure to compare 2 dissimilar Variables

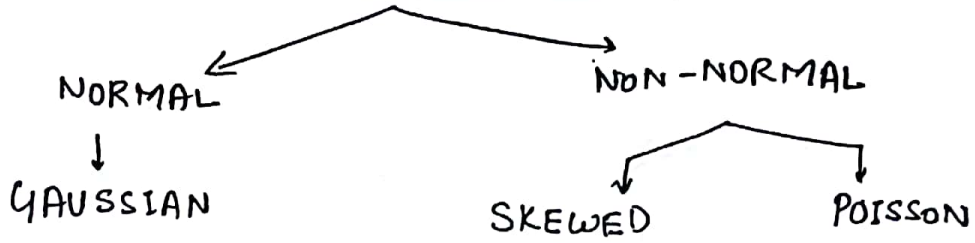
4) $Z\ score = \frac{X - Mean}{SD}$

↓

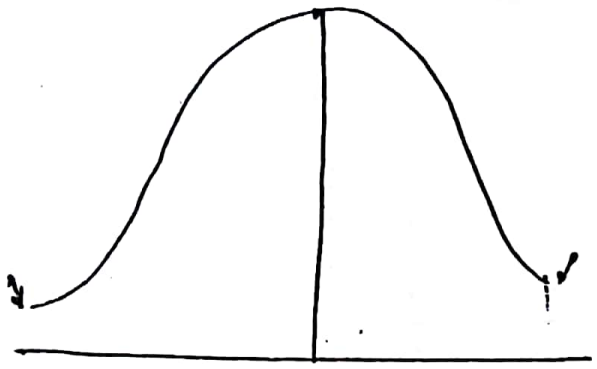
- Growth chart
- BMD of osteoporosis


Population
Sample
SE
SD

TOPIC-3 DISTRIBUTION OF DATA



GAUSSIAN

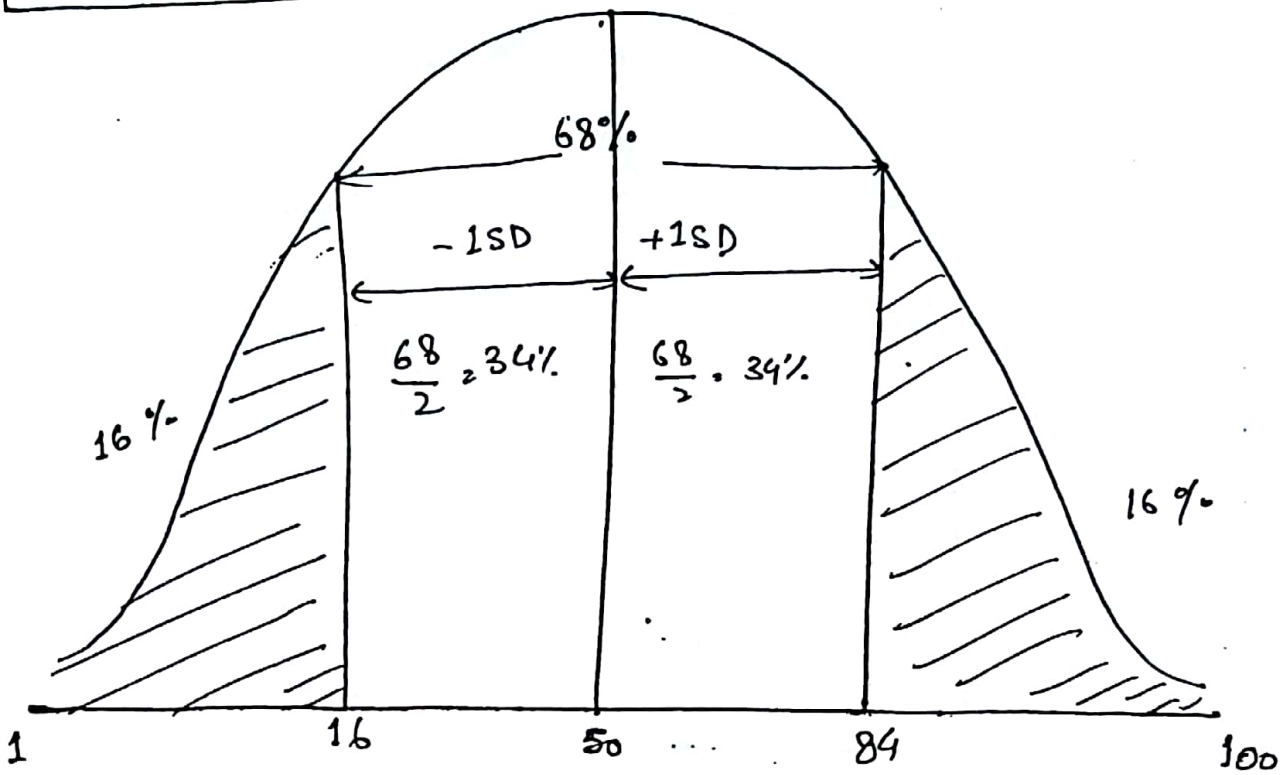


1) Bell shaped
2) B/L Symmetrical
3) Tails Touch X-Axis from $-\infty$ to $+\infty$
4) Area under curve 100% or 1
5) Mean = Median = Mode → Not the absolute values
6) S.D. = 1, Variance = $1^2 = 1$

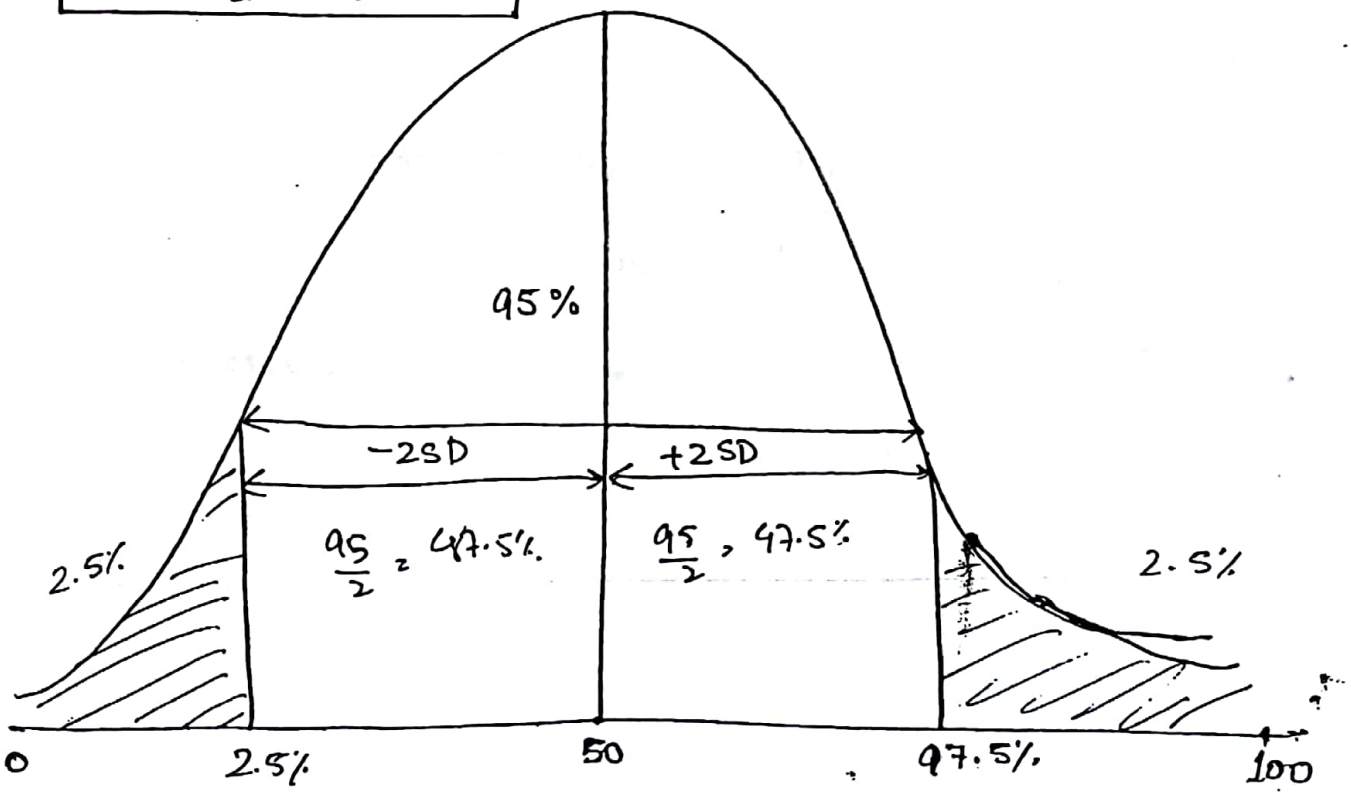
THEOREMS

Mean $\pm$ 1 S.D. = 68%
or
Median $\pm$ 2 SD = 95%
or
Mode $\pm$ 3 SD = 99%

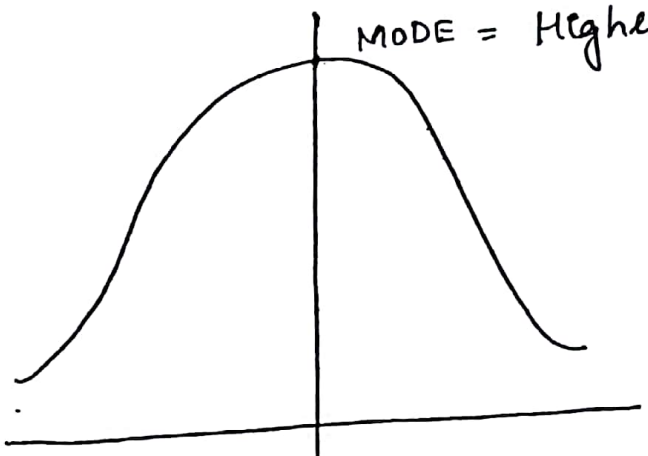
Mean ± 1SD = 68%



Mean ± 2SD = 95%

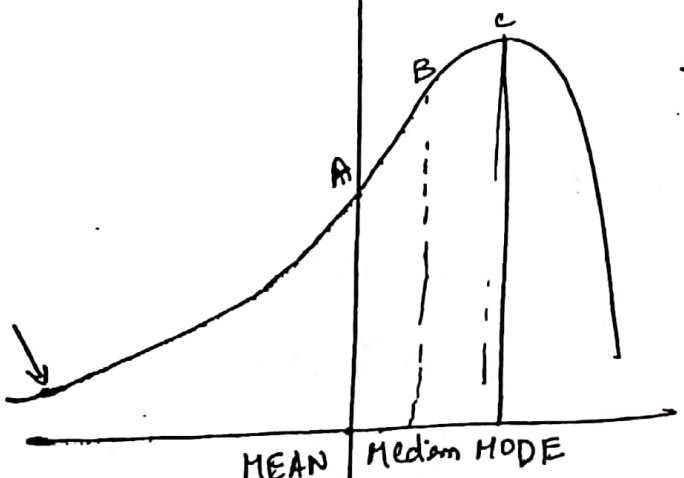


SKEWED



NORMAL

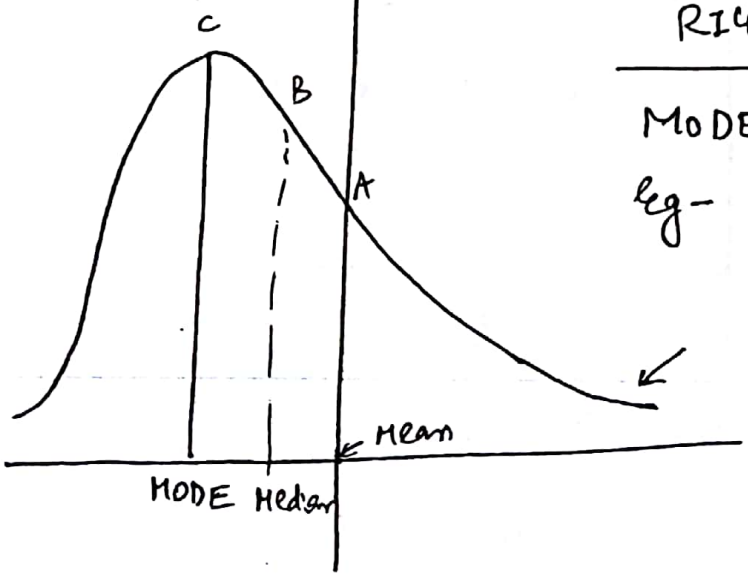
MEAN = MEDIAN = MODE



LEFT / SKEWED / -ve

MEAN < MEDIAN < MODE

eg- APGAR



RIGHT / +ve SKEWED

MODE < MEDIAN < MEAN

eg- Hb of children in slums

POISSON DISTRIBUTION

It is a probability Distribution

No Diagram/ curve

eg. → No. of email or phone calls received in a day.

→ No. of head Trauma pts. admitted in Hospital in a day

TOPIC 4A VARIABLE

(Any characteristic)

QUANTITATIVE (How much)	QUALITATIVE (How is it)

* Majority of variables can be both.

Depending upon 'How much they are measured'

wt - 120kg / 70kg / 40kg	overwt / (N) / underwt

* But some variables are purely Qualitative - like race, religion.

Gender ....

only No. ⇓ Frequency / sample size	No. + METRIC SCALE ⇓ Quantitative variable

Q. In a class of 400 students, 220 are boys + 180 are girls.

Variable ⇒ Gender

220 + 180 are frequency of sample size

II) BINARY/DICHOTOMOUS	POLYTOMOUS
2 ANSWERS	>2 ANSWERS
Ex. Yes/No	Tall/Med/short
Rh +/-	ABO Bl. Gps.

III) DISCRETE	CONTINUOUS
↓	
Can't take In Between values	Can take in between values
Ex. No. of Siblings	Wt. - 80.2
Pulse Rate	Temp - 37.9
	Hb - 11.2
	BP

A variable can take any of these 3 classification

Eg. Wt can be Quantitative, continuous, Polytomous

Topic 4b 7 SCALE OF MEASUREMENT

- CATEGORICAL → Qualitative Data
  - NOMINAL → Names only → Race, Religion, Gender → MODE
  - ORDINAL → Ordered Data → Severity of Disease, TNM staging, Socioeconomic status → MEDIAN
- METRIC / DIMENSIONAL → Quantitative Data
  - INTERVAL, RATIO → In stats we don't use them separately. → wt. (kg), Ht (cms) → MEAN

(1) LIKERT SCALE

(1) Type of Ordinal Scale

→ ~~Summative scale~~

(2) SUMMATIVE SCALE

Summarises human behaviour.

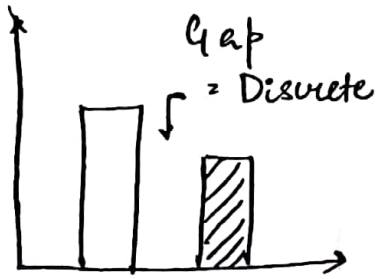
(3) Ordinal scale → median, mode ~~mean~~

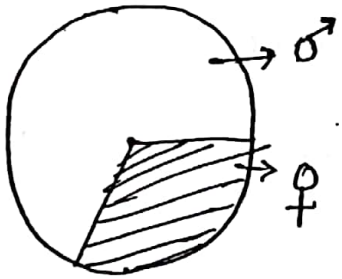
(4) Ex- Visual analogue / Pain scale

USELESS → GUTTMAN/ ADJECTIVINAL

TOPIC 5> GRAPHICAL REPRESENTATION OF DATA

QUALITATIVE	QUANTITATIVE	MISC
① BAR LINE	HISTOGRAM	PICTOGRAM
⇓	FREQ POLYGON	TREE
400 students	LINE DIAGRAM	SPOT MAP
220 Boys	CUMULATIVE FREQ	VENN
180 Girls	POLYGON / OGIVE	STEM & LEAF
② PIE	SCATTER DIAGRAM	QUARTILES





PIE

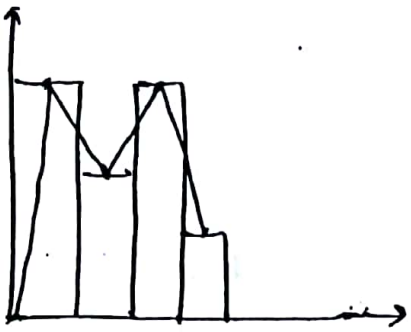
QUANTITATIVE DATA

Ht (cm)	fn	cumulative frequency
140.1 - 150	150	150
150.1 - 160	100	250
160.1 - 170	130	380
170.1 - 180	20	400
	400	

FREQ TABLE

CUMULATIVE FREQ TABLE

FREQ TABLE



Join mid points.

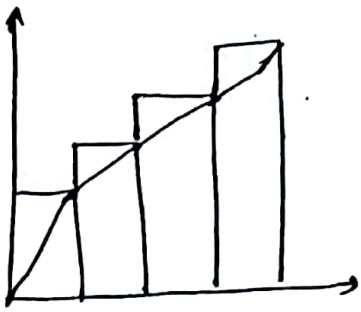
HISTOGRAM

↓

FREQ POLYGON / ~~CURVE~~ CURVE

↳ LINE DIAGRAM
(provides trend)

CUM. FREQ TABLE



Join end points.

OGIVE / CUM. FREQ POLYGON

MISCELLANEOUS DIAGRAMS

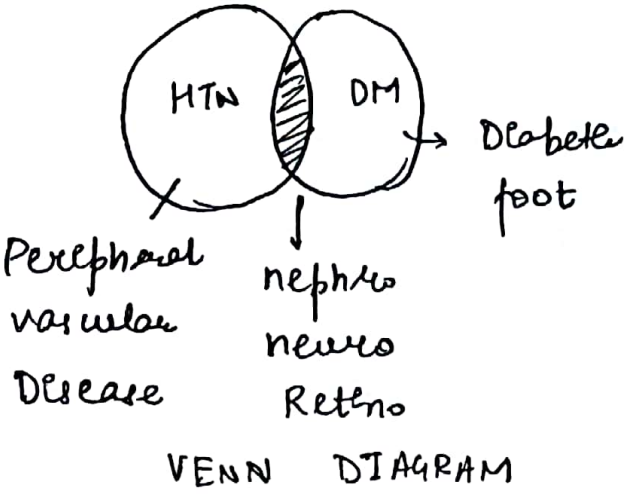
Suppose I want to explain to an illiterate Person-

1) Complica" of DM → PICTOGRAM

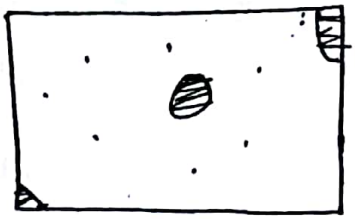
2) Progression of DM → TREE

3) Complica" of DM & HTN → VENN

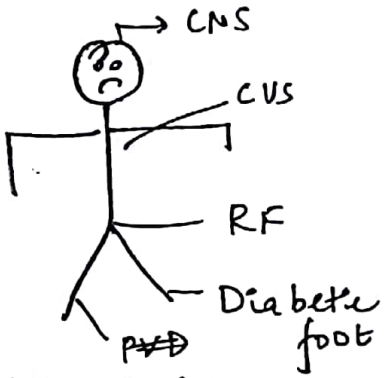
4) Geographical Distributon of DM in Delhi → SPOT MAP



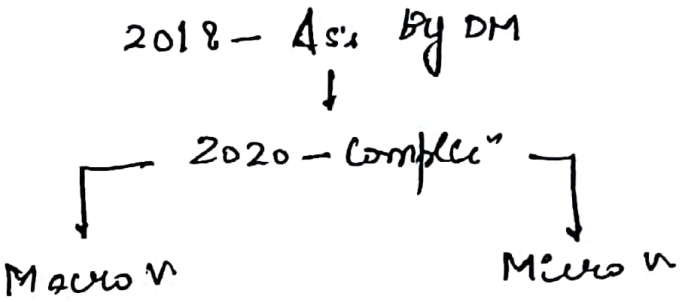
VENN DIAGRAM



SPOT MAP



PICTOGRAM

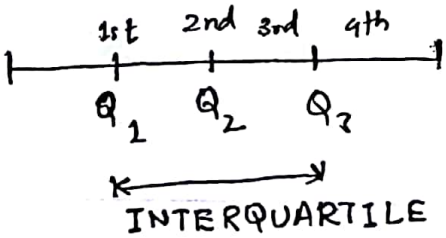


TREE

QUARTILES

NORMAL D.

EQUAL



RANGE = $Q_3 - Q_1$

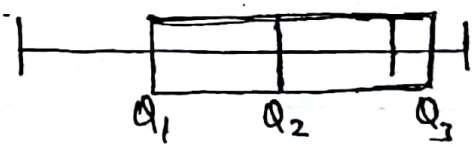
BOX & WHISKER PLOT

$Q_2 - Q_1 = Q_3 - Q_2$

ON-NORMAL D.

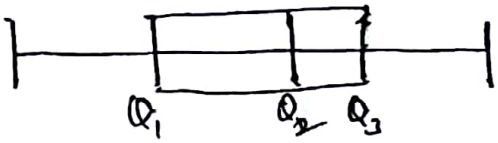
UNEQUAL

⇒ POSITIVE SKEW

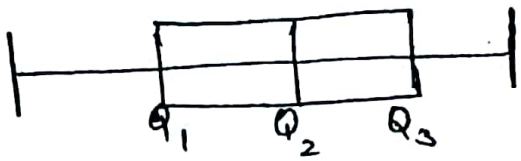


$Q_2 - Q_1 < Q_3 - Q_2$

⇒ NEGATIVE SKEW



$Q_2 - Q_1 > Q_3 - Q_2$



TOPIC-6

PROBABILITY

- DEPENDENT → ADD
  $P_{TOTAL} = P(A) + P(B)$
- INDEPENDENT → MULTIPLY
  $P_{TOTAL} = P(A) * P(B)$

TOPIC-7A.> SAMPLE SIZE

$n = \frac{4pq}{d^2}$ At 95% confidence interval for all observational studies

AIIMS

$n = \frac{z^2 pq}{d^2}$ ← d error if given, remember to get confidence ★

where $z = 1$, at 68% confidence

$z = 2$, at 95% confidence

$z = 3$ at 99% confidence

where, p = prevalence ← proportion / %

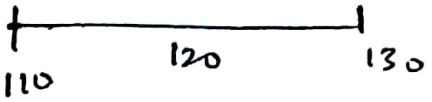
$q = (1-p)$ or $(100-p)$

d = ABSOLUTE PRECISION

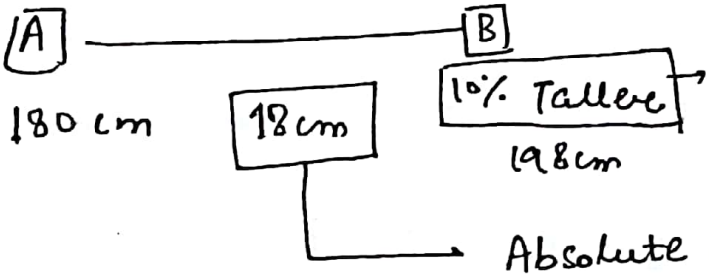
I) SBP_A = 120 mm Hg ± 10 mm Hg

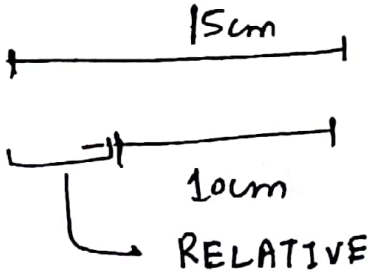
1	- 100	F	F
2	- 110	??	P
3	- 114	P	P
4	- 120	P	P
5	- 128	P	P
6	- 130	??	P
7	- 140	F	F

ABSOLUTE PRECISION



II (RELATIVE PRECISION





★ UNIT OF ABSOLUTE PRECISION IS SAME AS THAT OF VARIABLE

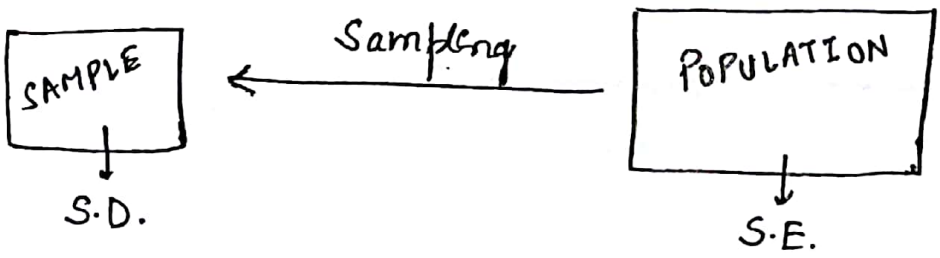
Eg. Prevalence variable, absolute precision will be in %.

⇒ If no prevalence is available or
If we are doing the study for the 1st Time.
we take p = 0.5 or 50%.
↓
Being it yield maximum sample size for a given absolute Precision.

⇒ POWER effects sample size in case of "INTERVENTIONAL STUDIES"

⇒ |

TOPIC 8A) CONFIDENCE



$$S.E. = \sqrt{\frac{pq}{n}} \qquad S.E. \frac{SD}{\sqrt{n}}$$

Mean ± 1SD = 68% or	± 1s . 68%
Median ± 2SD = 95% or	± 2s 95%
Mode ± 3SD = 99% or	± 3s 99%
Prevalence	SAME THEOREM

⇒ Whenever Population / confidence is mentioned, We need to calculate **Standard ERROR**

CONFIDENCE

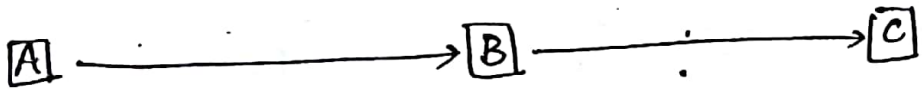
Research is done on sample & Results are generalised to the population.

95% confidence means ⇒ 95% sure dat my results will be true to the Population.

To achieve 100% confidence the entire population has to be studied

CONFIDENCE LEVEL = $1-\alpha$ or $100-\alpha$

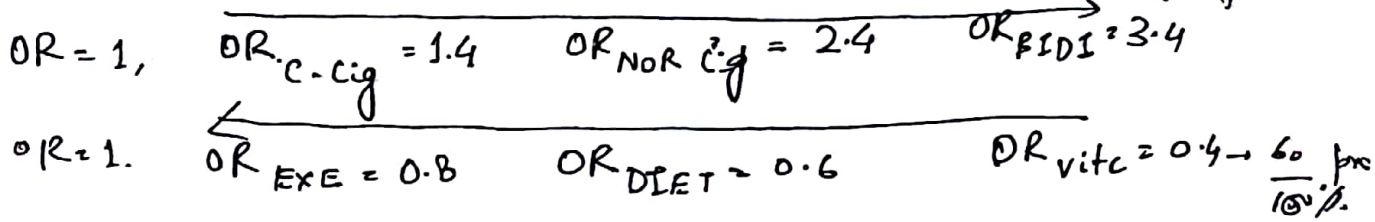
INTERPRETATION OF CONFIDENCE



A – If CI touches / Includes **NULL VALUE** It is statistically Insignificant.

- No Association — RR, OR = 1
- NO Relationship — $\rho = 0$

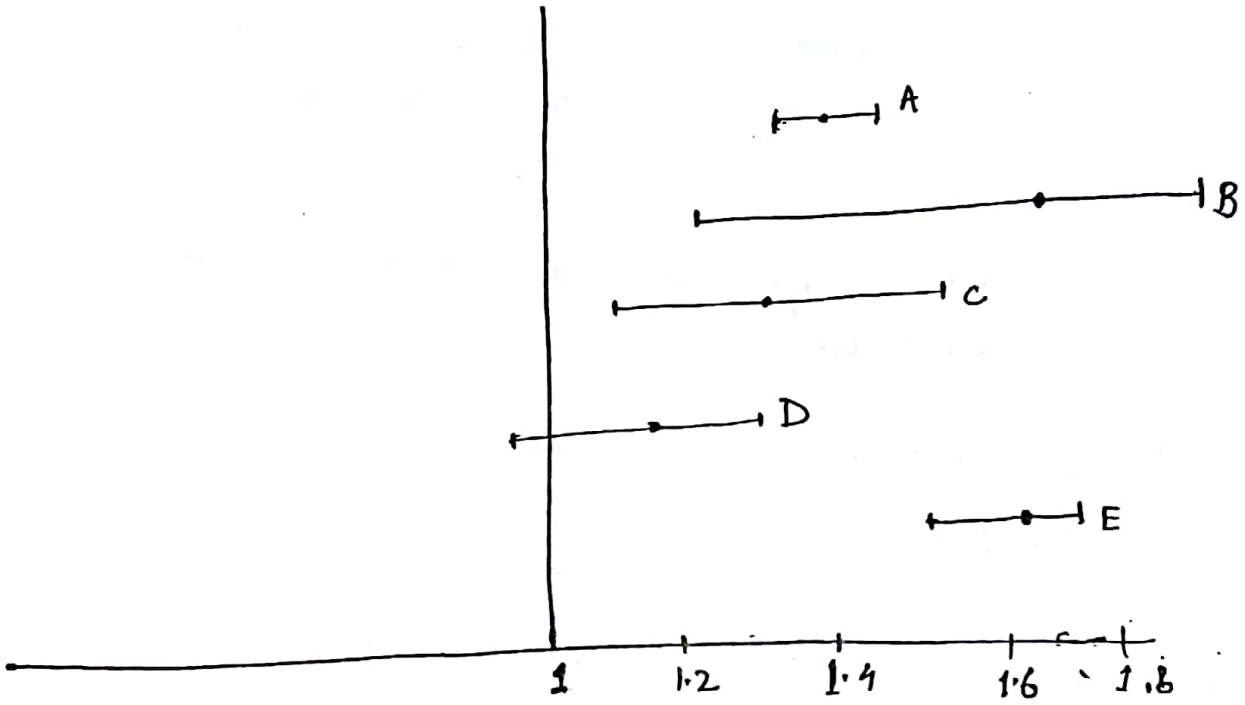
B – More the Distance of null value from Point Estimate, more is the statistically significant



C - Smaller the CI, more is the significance

Sample size LARGE.

$$\left[\downarrow SE = \frac{SD}{\sqrt{n}\uparrow} \Rightarrow \downarrow CI = \pm 2SE\right]$$



INSIG / WORST = D ← touches null value

MAXIMUM "N" = A ← minimum CI

MINIMUM "N" = B ← max. CI

BEST / MAX SIG = E. ← doesn't touch null value

Max. dist. from null value

Smaller CI:

STATISTICAL TESTS

— from Discussion paper.

SUMMARY

1> DISCRETE QUALITATIVE DATA — BAR, PIE

2> Continuous Quantitative Data → Histogram → FREQ POLYGON

Histogram → LINE DIAGRAM (Trend)

3> Relationship Scatter Diagram, Correlation, Regression

4> Progression of Disease - Tree Diagram

5> Overlapp of some features - Venn Diagram

6> Geographical Distribution - Spot Map

EPIDEMIOLOGY

I> Validity & Reliability from Discussion Paper

II> Bias . also from Discussion Paper.

MORBIDITY INDICATOR

INCIDENCE	PREVALENCE
~~(1) POPULATION AT RISK~~	~~(1) TOTAL POPULATION~~
(2) RATE	(2) PROPORTION
(3) CALCULATED FROM COHORT STUDIES	(3) CALCULATED FROM CROSS SECTIONAL
(4) NEW CASES/Pop^{n} AT RISK	(4) NEW + OLD CASES/ Total Population
(5) Imp. for preventive services / planning	(5) Imp for curative services & planning

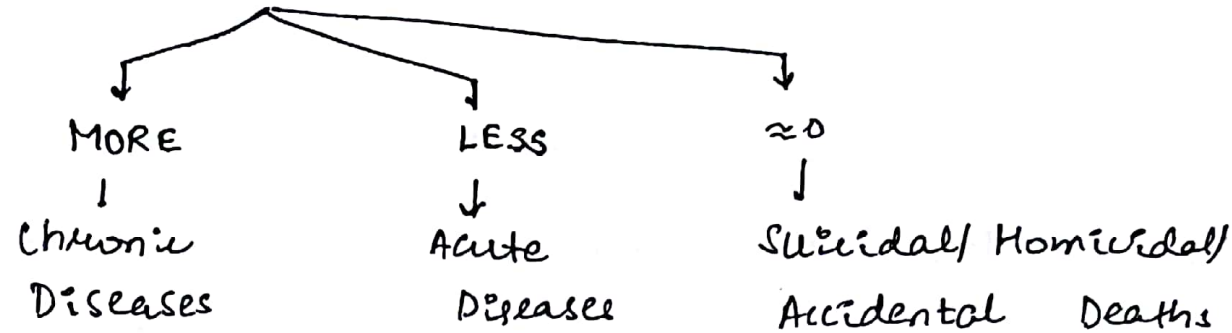
INTERPRETATION:-

1> Prevalence is of 2 types

- POINT
  - a) Calculated from cross sectional study
- PERIOD
  - b) calculated from longitudinal study

2) If nothing is mentioned we take it as point prevalence

3) $\text{PREVALENCE} = \text{INCIDENCE} \times \text{DURATION}$ (PERIOD)



4) Prevention Is Better than Cure

Preventive strategies → ↓ Incidence → ↓ Prevalence

Curative strategies (100% cure) → ↓ Prevalence

5) If for a Previously Fatal Disease, a new Rx is initiated & Prevents mortality But life long morbidity Persists, Prevalence ↑

Before 1920, any person of who developed DM used to die, But after discovery of Insulin in 1920, the deaths where prevented but Insulin doesn't cure of DM But ↑ses duration.

∴ Prevalence ↑ se.

MORTALITY INDICATORS

FORMULAE :

1) CDR = $\frac{\text{TOTAL DEATH}}{\text{TOTAL POPULATION}}$

2) SPECIFIC DEATH RATE = $\frac{\text{TOTAL NO. OF DEATHS IN SPECIFIC AGE GROUP /occupation/ Gender /Location ....}}{\text{Total Population}}$

3) PROPORTIONAL D.R. = $\frac{\text{Total No. of deaths In Specific age group /occupation/ Gender /Location...}}{\text{Total Deaths}}$

4) CASE FATALITY RATE = $\frac{\text{Total Deaths due to Particular Disease}}{\text{Total No. of cases due to same Disease}}$

MULTIPLICATION FACTOR

→ For all mortality & Morbidity Indicators

If total Population is not given, we take it as $\times 1000$.

except MMR ⟶ 1,00,000

or

Case Fatality Rate
Survival Rate
Couple Protection Rate
2° attack Rate
} → ·100

Pearl Index → 1200

RATE	PROPORTION	RATIO
Proportion + Time component	Prevalence = Total cases / Total Population Numerator is part of denominator.	Sex Ratio = ♀/♂ Numerator is not the part of Denominator.

CFR & 'Proportional D.R.' are MISNOMER.
As no time component is taken

MMR
N = M.M.
D_1 = No. of L.B.
D_2 = No. of ♀ of reproductive age group

MM RATE → D_2

MM RATIO → D_1

IMPORTANCE OF MORTALITY INDICATORS

1) BEST INDICATOR OF DISEASE BURDEN

a) mortality Indicator → PROPORTIONAL D-R

b) morbidity Indicator → PREVALENCE

c) Health Index → HALE.

2) CFR-

a) ↑ Killing Power of disease → ↑ virulence → ↑ CFR

b) Acute Disease

c) CFR = 1 - Survival Rate

or

CFR = 100 - Survival Rate

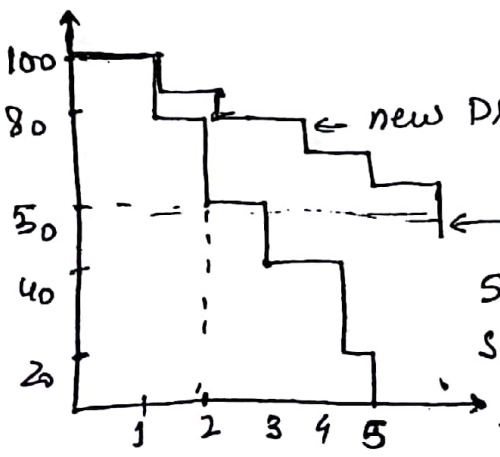
SURVIVAL RATE ⟹ cancers

a) prognosis

b) Yardstick for assesment of therapy

AIIMS KAPLAN MEIR CURVE → survival

Special Type of Regression = 'COX'S STEPLADDER PROPORTIONAL HAZARD PATTERNS



5yr survival = 0.

Median survival = 2yrs.

Max. Death occurs in 2 yr = 2 year.

3) SPECIFIC D.R..

a) 'AT RISK' Population

b) Comparison of Deaths In **same** Population

Standardised/ Adjusted D.R. ← Two Different Population

ADJUSTED/STANDARDISED

* STD- POPULATION -
  - → National Population is not the Std. Population
  - → Population where no. in each age & sex groups are known

Standardisation

DIRECT

When no. of People & No. of Deaths In each age & sex. Group In known

INDIRECT

when it is unknown

SMR [Standardised Mortality Ratio]

SMR >100 → Hazardous occupation

Standardisation removes confounding effect of Different age structures &

∴ **Age Standardisation D.R.** is **Best** to compare vital statistics of a country.

'Detail not Imp'

EVIDENCE BASED MEDICINE

1) DEF^{n} -

* Applying Best Available evidence gained from scientific methods to clinical Decision making
* seeks to assess quality of clinical Practice objectively (no subjectivity)

2) IMP- Gold Std. of clinical Practice

3) Father → David Sackett

4)

ICD

International Classification of Diseases - ICD Σ

① consists of 22 chapters

② Revised every 10yrs

③ Arranged in 3 volumes

ICD XI → 2018

SDG

Sustainable Development Goals.

1) 17 Goals (Goal No. 3) └ health

2) TARGETS → To Be achieving By 2030

GLOBAL

→ MMR < 70/1 Lakh L.B

→ NMR < 12/1000 L.B.

→ USMR < 25/1000 L.B.

↓ By 33% Premature mortality From NCD's

↓ By 50% Global Deaths & Injuries from RTA's

MATCHING AIIMS

1) DEF^n:-
Process of Selecting controls so that they are Similar to cases ~ regards to certain Variables

2) CAUTION:- OVER MATCHING
↓
Don't match for variable of Interest as won't be able to get statistical Test

3) ELIMINATION - It eliminates ∨ Confounding known

4) DONE IN - Case Control >> Cohort

CAUSATION / CASUALITY

10 FACTORS

Most Imp Study Design to study

1> CAUSALITY → Double Blind RCT

2> TEMORALITY → COHORT

~~3~~

A> TEMPORALITY - Most Imp. / Mandatory

Exposure → Disease

Smoking → Lung Ca

MBBS → MD/MS

B> DOSE RESPONSE -

Smoke 10 cigerette → Ca in 1 year

Smoke 1 cigerette → Ca in 10 year

C> REVERSABILITY -

Stop smoking → Relapse

D> BIOLOGICAL PLAUSIBILITY - Feasibility

E> SPECIFICITY -

Weakest - / Most Difficult

Only 1 Risk Factor is associated ~ 1 disease.

Not possible to prove in Non communicable Disease

F) STRENGTH ⟶ Relative Risk

G) CONSISTENCY

H) COHERENCE

I) STUDY DESIGN

J) JUDGING BY EVIDENCE

GRADING OF STUDY DESIGNS

TOP

META ANALYSIS & SYSTEMATIC REVIEW

DOUBLE BLIND RCT

COHORT

CASE CONTROL

LONGITUDINAL

CROSS - SECTIONAL

ECOLOGICAL

CASE SERIES

CASE REPORT

BOTTOM

INTERNATIONAL DEATH CERTIFICATE

Ia → ~~Underlying~~ Immediate cause of Death

Ib → Underlying cause of Death

Ic → Main underlying cause of Death

II → other cond" not directly leading to Death

I_a & I_c ⇒ MANDATORY

I & II ⇒ OPTIONAL

I_c is most Imp. as we do ICD - classification Based on it.

STUDY DESIGNS

[WHO CLASSIFICATION]

- **OBSERVATIONAL**
  - **DESCRIPTIVE**
    - ✓CASE REPORT
    - ✓CASE SERIES
    - ✓CROSS-SECTIONAL
    - ✓LONGITUDINAL
  - **ANALYTICAL**
    - ✓ECOLOGICAL
    - ✓CASE CONTROL
    - ✓COHORT
- **INTERVENTIONAL**
  - **NON-RANDOM/ QUASI**
    - EVALUATN STUDIES
    - CESSATN STUDIES
    - NATURAL EXPERIMENTS
    - PRE-POST CLINICAL TRIAL
  - **RANDOM**
    - RCT

* For all Study Design, unit of study is an individual except for Ecological Study (whose unit of study is population)

* PARK & MCQ Book consider Cross-sectional & longitudinal Study as Analytical study ∴ it wrong

DESCRIPTIVE STUDY

No Comparison No Temporality

1) CASE REPORT
Single
↓
1st study Done for any research

2) CASE SERIES
Multiple
[Ab (N) C/F/ Diagnostic/ Prognostic feature.]

3) CROSS - SECTIONAL
single
↓
Point Prevalence

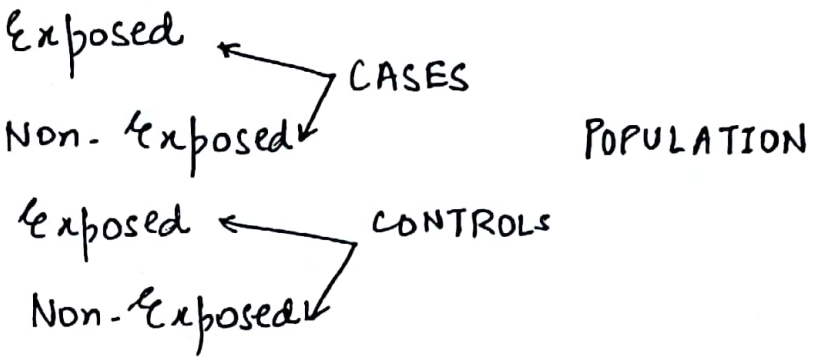
4) LONGITUDINAL
Multiple
↓
Period Prevalence

Snapshot Studies i.e. Both exposure & Disease are measured at same time

←——— Done for chronic Disease ———→

CASE CONTROL

(I)



(II)

	Exposed	Non-exposed
CASE	a	b
CONTROL	c	d

(III)

$$\text{ODD's RATIO} = \frac{ad}{bc}$$

$$\text{ODDS RATIO} = \frac{\text{ODDS of Being Exposed In Cases}}{\text{odds of Being Exposed in Controls}}$$

$$\text{ODDS} = \frac{P}{1-P} = \frac{\text{Probability that event will occur}}{\text{Probability that event will not occur}}$$

COHORT

(I) POPULATION → Exposed → Diseased / Non-Diseased
POPULATION → Exclusion
POPULATION → Non-Exposed → Diseased / Non-Diseased

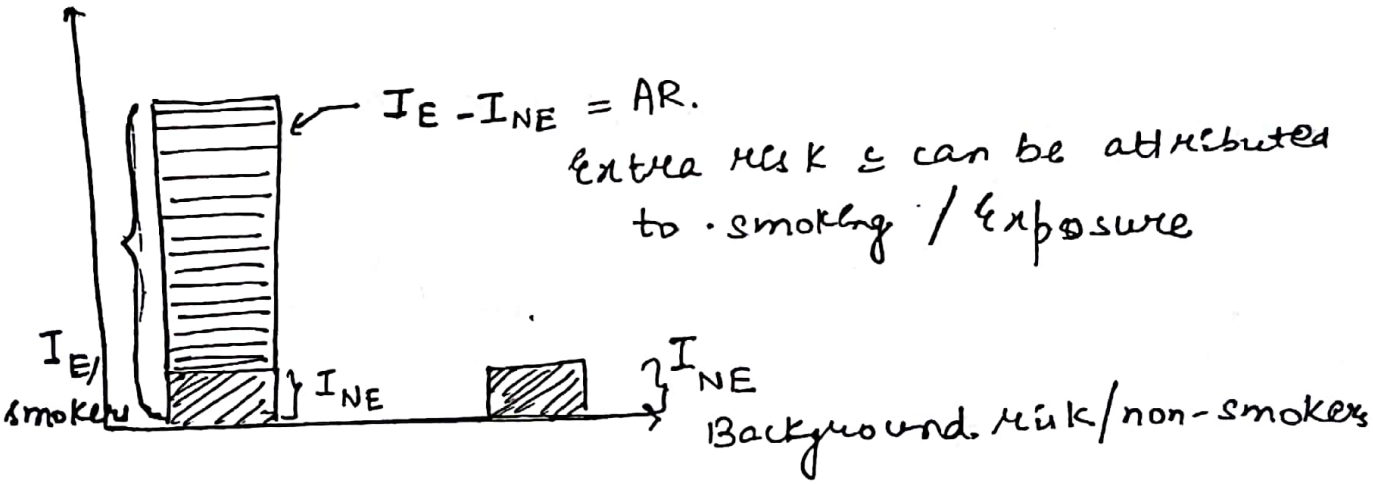
V.V.Imp

(II)

	Dis	Non-Dis
EXPOSED	a	b
NON-EXPOSED	c	d

(III) $RR = \dfrac{\frac{a}{a+b}}{\frac{c}{c+d}}$

$$\text{RELATIVE RISK} = \frac{\text{Incidence of Disease in Exposed}}{\text{Incidence of Disease in Non-Exposed}}$$



$$\text{PROPORTION AR} = \frac{I_E - I_{NE}}{I_E}$$

[AR do not have denominator]

RR = Imp. for clinicians

AR, PAR = Imp for Both

Population AR = Imp. for ~~clinicians~~ Public Health Specialists.

COMMON POINTS

INTERPRETATION OF OR ↑ OR ⇒

OR, RR	ASSOCIATION	
>1	+ve	Risk Factor
=1	NO	–
<1	–ve	Protective Factor

* In Both cohort + case-control study, multiple comparison groups can be taken For 1 case upto [4 controls] can be taken.

TYPES OF COHORT

* If nothing is mentioned in question then we take it as Prospective Cohort

- CONCURRENT
  - PROSPECTIVE
    1) At the start of study neither the exposure nor the disease has occurred. After the start of study 1st der will be exposure then der will be disease
  - AMBISPECTIVE
    ① At the start of study exposure has already occurred but disease has not yet occurred.
    ② ∴ at the start of study any person who is diseased would be excluded
- NON/CURRENT HISTORICAL/ RETROSPECTIVE

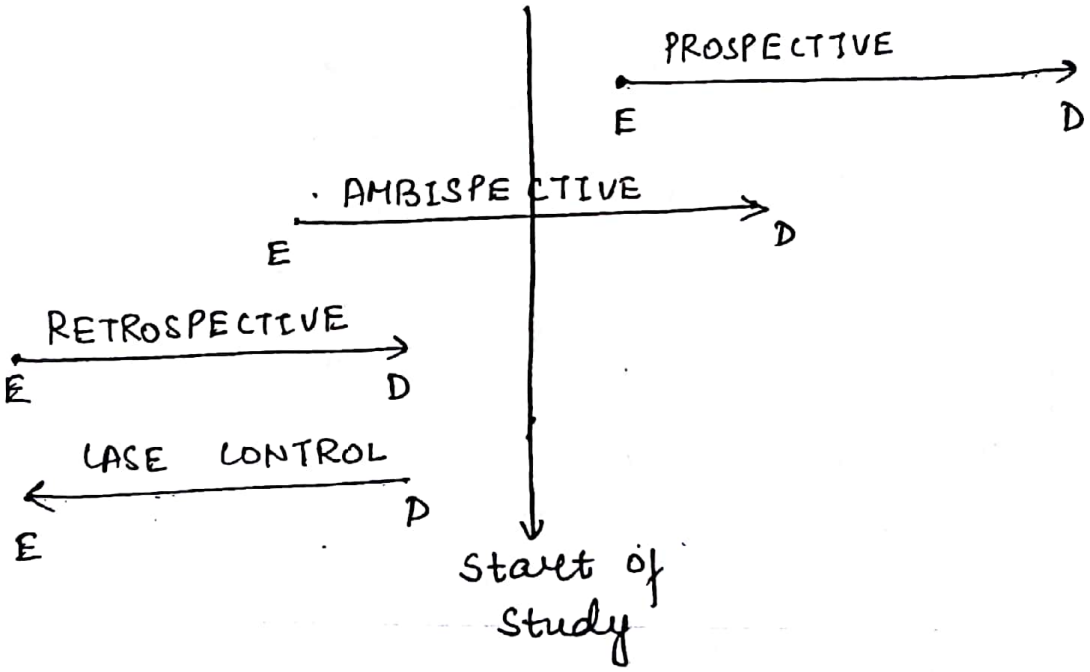
Prospective

2) ∴ if any person is exposed & or diseased at the start of study they would be excluded

HISTORICAL

① At the start of study both exposure + diseased have occurred.

② It is differentiated from Case-control study by the direction of arrow + Retrospective study is ~~Hist~~ record based whereas case-control exposure is asked.



ECOLOGICAL STUDY

Population is the unit of study

ECOLOGICAL FALLACY -

Generalising the findings of the population to an Individual is wrong

Example- People from Japan have ↑sed risk of Stomach cancer (ECOLOGICAL STUDY)

Any person from Japan will develop Stomach person (wrong generalisation → ECOLOGICAL FALLACY)

INTERVENTIONAL STUDIES

POPULATION → Exposed [NON-RANDOM] / Non-Exposed

[COHORT]

↑

NATURAL INTERVENTION

POPULATION (Random) → Exposed / Non-Exposed

[RCT]

↑

ARTIFICIAL INTERVENTION

DOUBLE BLINDING

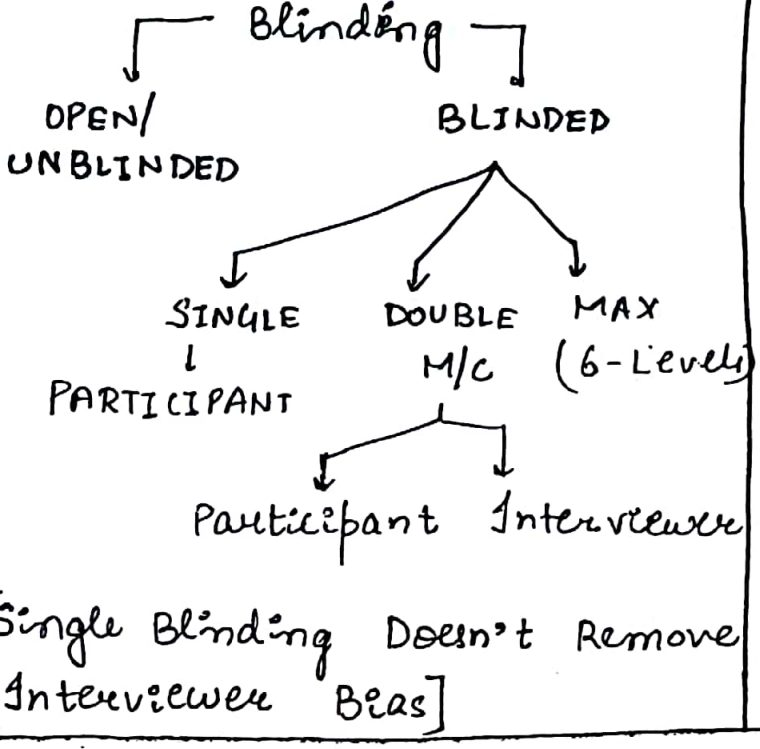
» It removes Interviewer Bias

» Blinding Done Before Data collection

MATCHING

It removes SELECTION BIAS

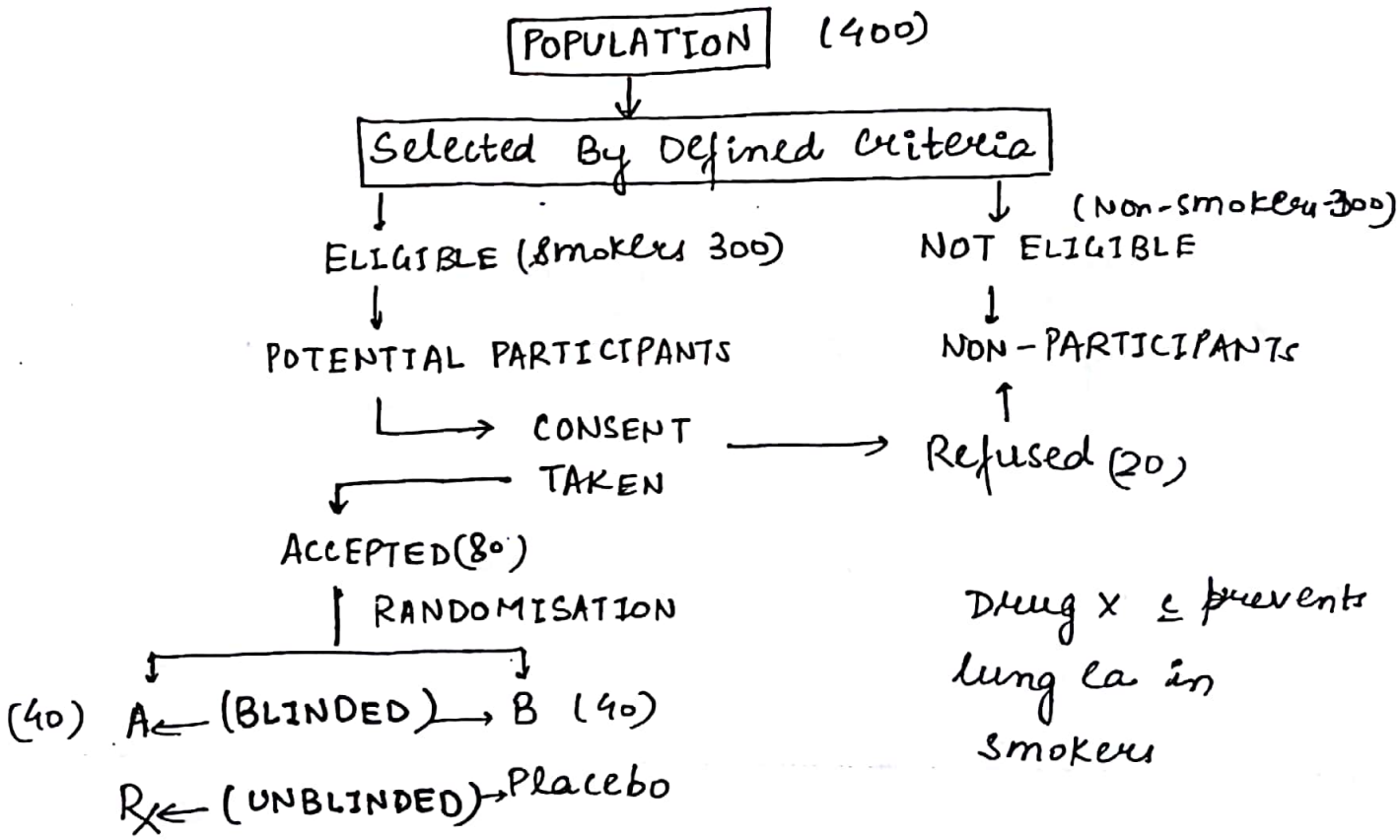
Randomization done Before Recruitment.



*[Single Blinding Doesn't Remove Interviewer Bias]

Uses Internal Validity

Makes Groups compareable at Baseline



Drug X ↓ prevents lung ca in smokers

→ Metaanalysis & systemic reviews.

→ Nested case control.

→ Case-cohort.

→ Types of RCT.

Chapter.	Chapter Name	Imp. Topics	NEET	AIIMS 48
1)	History	Images	2	0
2)	Health . Disease	Prevention. HDI / PQLI / MPI	2	1
3)	Epidemiology	entire chapter	5	4
4)	Screening		4	3
5)	Common Disease	Basics Vaccination	4	1
6)	NCD	Cancers	1	0.
7)	Health Programme	TB, HIV, New Prog	4	1.
8)	Demography . Infertility Indicators	Demographic pyramid Fertility Indicators	2	1
9)	Obs . ped.	one liners	5	1
10)	Nutrition	MUG UP	2	0
11)	Sociology	useless	0	0
12)	Environment	Images MUG UP	3	0
13)	BMW	Guidelines	2	1
14)	occupational health.	NEW ESI guidelines.	1	0

					49
15>	Disaster	}	useless	0	0
16>	Mental Health				
17>	Genetics				
18>	Statistics		entire chapter	6	5
19>	Communication	}	Types, Delphi method.	1	0
20>	Management		Mx methods	1	0
21>	Health Care of community		community health system	2	1
22>	International health		useless	0	0

TYPES OF RCT

FACTORIAL RCT

In 1 RCT 2 Interventions are tested & are not related to each other

PLANNED CROSS-OVER RCT

100 pt Disease

50 Rx x 1 month → 50 Placebo

Washout Period x 2 months

50 Placebo x 1 month → 50 Rx

It remove the ethical issues.

Rx should not involve ↓ Sx.

UNPLANNED CROSS OVER

~~100 cancer~~

~~Intention to Rx~~

~~50 chemo~~

~~50 Sx~~

~~Per Protocol Analysis~~

100 cancer

50 chemo

50 Sx

5 serious

10 refuse Sx

urgent Sx

10 chemo.

50 + 10 - 5 = 55

50 - 10 + 5 = 45

ANALYSIS

Intention to Rx	Per Protocol Analysis
50 Chemo	55 chemo
50 Sx	45 Sx
	(as per actual Rx)

METAANALYSIS & SYSTEMIC REVIEW

1) When multiple studies on a single topic are combined then sample size ↑ × hence power of study ↑

2) Summary statistic → I^2

3) Summary Diagram → Forest Plot

4) Limitation → a) GIGO (Garbage in : Garbage out)

b) Publication Bias → Funnel Plot

c) apple & orange effect - Compare dissimilar things

ADVANCED COHORT STUDY

1) Predominantly cohort (Because of forward direction)
2) Mixed study design (Cohort + Case control study)

Cohort

↓

Temporality +nt

Recall Bias is eliminated

Case control

↓

Rare Disease

whose Asstn tests are costly

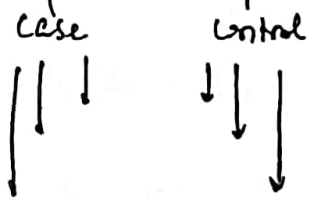
TYPES

NESTED CASE CONTROL

⇓

Control will be alloted the moment case occurs

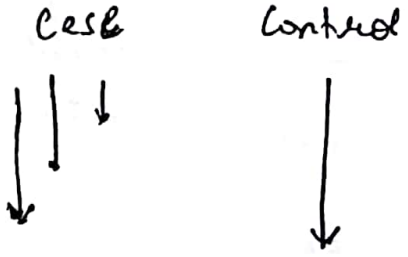
(matched for types of follow-up)



CASE COHORT

⇓

Control is alloted at end of study



Control assigned @ end

E —Causal Pathway→ D

3rd Factor

Interfere In causal Pathway → Pathology — Latent/ Pre-cancerous

Doesn't Interfere In causal Pathway → Epidemiology

E → D

3rd Factor

CONFOUDING

E → D

C

Related to Both 'E' & 'D'

1940 Rich USA Coffee Drinker → Pancreatic Cancer

Smoking

EFFECT MODIFIER

E → D

EM

Related to 'D' only

Unprotected Intercourse (EM-ve) → HIV

Circumcision

Asbestosis → Lung Ca

(EM+ve)

Smoke

METHODS OF REMOVING 3rd FACTOR –

1> Randomisation – Best
(Remove Both Known & Unknown)

2) Matching – Remove only known

3) Stratification – g. unadjusted.
or
1.9.

↓ stratification By 3rd factor

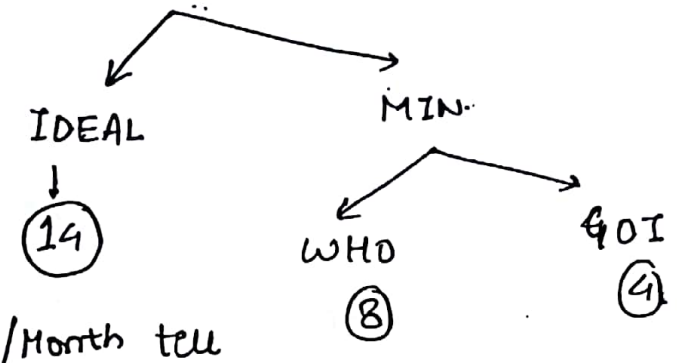
2 Groups will be formed

ĩ 3rd Factor	ĩ out 3rd factor
If Adjusted OR is same In Both Groups	Diff. in Both Groups
↓	↓
Confounder	Effect Modifier
$OR_{adj} = 1$, In Grp 1	$OR_{Adj} = 1$ In Grp 2
	$OR_{Adj} = 1.5$ in Group 1
	& $OR_{Adj} = 1.1$ In Group 2

OBSTETRICS

ANC

I> ANC Visits



1 Visit / Month till 7 month → (7)

1 visit / every 15 day in 8th month (2)

1 visit / every week. 9th month (4)

9 month + 7 day : 1.

14

1st visit < 12 wk (early Registration)

2nd Visit 14-26 wk

3rd visit 28-34 wk

4th visit > 36 wk

PNC Visit = No schedule

HBPNC = Home Based Post Natal Care

ANM + ASHA WORKER MAKE HOME VISITS TO PROVIDE PNC CARE.

SCHEDULE

Hospital Delivery	Home Delivery
3, 7, 14, 21, 28, 42	Day 1 (extra) Rest same

ANC SERVICES UNDER RMNCHA

I) LAB INV.

SUB CENTRE	PHC + ABOVE subcentre +
a) UPT KIT	1) VDRL
b) Hb	2) HbsAg
c) Urine → albumin, Sugar	3) HIV
d) RDT (malaria)	4) Blood grouping
	5) RBS

NISHAY → UPT Kit
NIKSHAY → T.B.

NEET 2018

II) INTERVENTIONS –

1) Deworming – Albendazole is c/I. in 1st Trimester

DOC in 1st Tri → MEBENDAZOLE 100mg BD × 3 days

DOC in 2nd + 3rd Tri. → ALBENDAZOLE 400mg OD to chew stat

2> CALCIUM

RDA ♀ = 1200 mg/day

Calcium is given as supplement in form of $CaCO_3$ 500mg BD from Day 1 of 14th week POG. till 6months Post Delivery. (1yr).

3> TETANUS TOXOID-

a> Every ♀ in her 1st ♀ will Receive 2 doses of T.T.

- 1st Dose
- 2nd Dose

1st Dose @ point of contact

@ an interval of 4-6 weeks.

b> If ♀ had received 2 doses of T.T. at an interval of < 3yrs ⇒ SINGLE BOOSTER DOSE Given

c> If ♀ who is completely ~~UIA~~ unimmunised comes to you at ~~POG~~

POG < 36wks

⇓

Give T.T. as would be given to (N) ♀

POG > 36wks

⇓

Give 1st Dose of T.T. & explain to mother that this dose won't protect her baby from MNT (maternal neonatal Tetanus)

Newborn is given 750 IU of anti toxin within 4hrs of Birth

Give 2nd Dose after 4wks irrespective of ♀ outcome

4) IFA :- ★★

a> 100mg of Elemental Iron + 500 µg Folic Acid

b> In 300mg of FERROUS SULPHATE SALT
(% of elemental Iron = 33%)

c> Red coloured capsule / Tablet

d> To be consumed ~~c~~ LEMON WATER

e) After food

f> from Day 1 of 14th week POG till 6months post Delivery (1yr)

Hb > 11 → OD → 365

9-11 → BD → 365 x 2 = 730

CALCULATION

* NO. OF ♀ IN A YEAR -

x = Birth Rate × Population of an area (per 1000 Pop)

$y = x + \underbrace{10\%\ x}_{\text{abortion.}}$

Q. B.R = $\frac{20}{1000}$ Subcentre Popu. (5000) $y = ?$

$$y = \left[\frac{20}{1000} \times 5000\right] + \frac{10}{100}\left[\frac{20}{1000} \times 5000\right].$$

$$= 100 + 10$$

$$= 110.$$

No. of ♀ at any given point = $\frac{y}{2}$

DELIVERY

CLEANS OF SAFE DELIVERY :-

Clean Hand — Cord — cut

" Table — Tie

" Towel — Stump

" Water

MATERNAL MORTALITY

Any ♀ female during ♀ / delivery / Post-Delivery till 42 days dies due to ♀ related causes & not due to accident or trauma irrespective of period of gestation is called MATERNAL MORTALITY.

MMR

- MM RATE
- MM RATIO

Numerator = M.M.

Denominator
↓
No. of ♀ in reproductive age group

Denominator
↓
No. of Live Births

M/C type of Maternal Death is ⇒ POST PARTUM.

CAUSES

DIRECT	INDIRECT
Haemorrhage (37%) (APH + PPH)	Anaemia (55%)
Abortion	
Sepsis	
Eclampsia	
Others	

MCC of MM -

Haemorrhage

Anaemia

PPH

PROGRAMMES

1) PMSMY (Pradhan Mantri Suraksit Matritva Yojna)

9th ~~April~~ Every month → every ♀ female is provided free of cost ANC services @ all level of health system in Govt. setup where doctor is available & enrolled private health facilities

2) COLOUR CODED PROGRAMME

RED = High Risk ♀

GREEN = Normal

BLUE = PIH

YELLOW = Systemic Diseases

3) ♀ AID YOJNA SCHEME

Every ♀ female for a successful 1st ♀ would get 6000 Rps as Incentive

1000 = JSY

5000 + under this Programme

INFANTOMETER

Used to measure ht of Baby tell 2years

I-NIPI (V.V.I.)

(Intensified National Iron Plus Initiative)

This is under POSHAN ABHIYAAN

↓

PM's overarching scheme for Holistic Nourishment.

SLOGAN – Sahi Poshan, Desh Roshan

VISION – Anaemia mukt Bharat

6 × 6 × 6 PYRAMID

6 Intervention | 6 Beneficiaries | 6 Institutional Mech.

OBJ – To ↓ anaemia by 18% in each Beneficiary Group. by 2022

→ 6 BENEFICIARY GROUPS

6 - 59 months

15 - 19 ♀

15 - 19 ♂

♀ In reproductive age group.

♀ female

Lactating ♀.

6 INTERVENTION

1) Prophylactic IFA supplementation
2) Deworming
3) Intensified Year Round Behaviour change
4) Communication Campaign
5) Anaemia Testing
6) Mandatory Provision of IFA fortified foods under public health programme.
like Mid-Day meal +
Anganwadi supplementary Nutrition Programme

6> Addressing Non-nutritional causes of Anaemia

Malaria ← ↓ → Flourosis
Sickle cell

DEWORMING ⇒ ALBENDAZOLE (DOC)

< 1yr - 9I

1-2yr → 200mg OD to chew stat

>2yr → 400mg OD to chew stat

NATIONAL DEWORMING DAY = 10/02
10/08

AGE	DOSE	COLOUR	OTHERS
6-59 mnths	20mg IRON + 100 µg Folic acid	Liquid formulation	Biweekly
5-9 yrs	45mg IRON + 400 µg folic acid	PINK colour	Weekly 1 IFA
10-19 yr	100 mg IRON + 500 µg Folic acid	Blue	Weekly 1 IFA
20-49 yrs	100mg IRON + 400 µg Folic Acid	RED	Weekly + 1 tab /day of folic acid (400 µg)
♀	100mg IRON + 500 µg Folic acid	RED	Daily from Day 1 of 14th week POG till 6 months Post ~~Natal~~ Delivery

WIFS

→ Weekly IFA Supplementation.

→ On every MONDAY every adolescent ♂ & ♀ going to a govt. or govt. aided school is provided ∈ Blue colour capsule

→ To all adolescent ♀ not going to school @ Anganwadi

→ Both Married & Unmarried ♀ & ♂ are covered under this programme
(Adolescent male not going to school are left out)

PAEDIATRICS

BREAST FEEDING

BF ⇒ EXCLUSIVE BREAST FEEDING

→ Baby is only on Mother's Milk ∈ may be

naturally feed

artificially feed ∈ spoon or paladai

8-10 times a day
mandatory 1 right feed for
duration of 6 months

→ ORal vaccines & medications if prescribed are allowed.

no water or artificial feeds are allowed

⇒ LAM CRITERIA

Lactational Amenorrhoea

- ♀ undergoing exclusive breast feeding for 6 months gets advantage of ~~lactational~~ lactational amenorrhoea till 6-12 wks
- It is natural mode of contraception

⇒ BFHI (Baby Friendly Hospital Initiative)

a) By WHO + UNICEF

b) 10 Steps

- Critical Mx Procedures
  - 1 → a, b, c
  - 2
- Key clinical Practices
  - 3-10

c) Objective ⇒ succesful Breast feeding Practice

d) MFHI ⇒ mother friendly Hospital Initiative (MFHI) only in USA.

Breast Feeding wk ⇒ 1st week of August

⇒ ADVANTAGE

NEONATE

- Diarrhoea ↓
- Pneumonia ↓
- Better Dentition
- Type 2 DM in adulthood ↓
- ↑ IQ

MOTHER

- Breast Ca ↓
- Ovarian Ca ↓
- Type 2 DM
- Post Partum depression

BIRTH ~~WEIGHT~~ WEIGHT

① **LBW** < 2.5 kg

a) H/C cause = PREMATURITY

b) No. of Babies to be weighed randomly to calculate % age of LBW = 500

c) B.W. of <2.0 kg is a C/I for Hep B^{0} vaccine

d) % in India = 18.5 % (data may change)

② **VLBW** <1.5 kg

③ **ELBW** <1.0 kg

④ Avg. B.W. in India = 2.8 kg

⑤ Cut off for Prophylactic Admission into NICU = 1.8 kg

(6) KMC = Kangaroo Mother care
Supportive care to new Born <2.5 kg

GROWTH MONITORING / LONGITUDINAL FOLLOW UP STUDY

NORMAL CHILD

↓

0-1 yr - Every Month

1-2 yr = Every alternate month

2-5 yr = Every 3rd month

MALNOURISHED CHILD

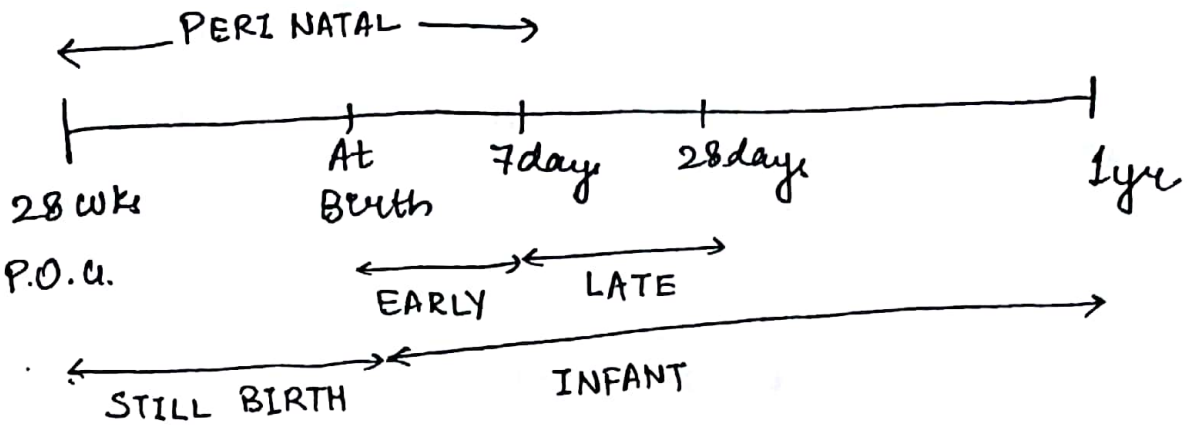
Mod. mal. = Every week

Severe mal = Admission in NRC (nutritional Rehab. centre)

↓

Free Rx for children < 5 yrs of age

PAEDIATRIC MORTALITY



DENOMINATOR

WHO ↓

No. of Live Births

GOI

↓

No. of Live Births except for "Peri-natal M.R. & Still B.R."

↓

[No. of Live Birth + Still Birth]

CAUSES

ENDOGENOUS

⇓

1) Prematurity (33%)
2) LBW (28%)
3) Infections (Torch)
4) Birth Asphyxia
5) Birth Trauma
6) Still Birth

Perinatal Mortality

Neonatal Mortality

EXOGENOUS

⇓

1) Pneumonia
2) Diarrhoea
3) Malnutrition
4) Accident
5) Child Birth
6) Under 5 mortality

IMR

(Endo > Exo)

Most Imp Indicator for Socio-economic

Status → IMR

Development → Under 5 mortality Rate

IMR

Most Imp. Indicator of ~~health status~~

a) health status of community

b) Level of living

c) Effectiveness of MCH service

d) Best Predictor of Govt. failure

e) Combined Parameter of Paediatric + Obstetric care in country

f) Sensitive Indicator of availability + utilisation of health service

CHILD SURVIVAL INDEX / RATE	=	$\frac{1000 - \text{Under 5 MR}}{10}$

CONGENITAL DISORDERS OF NEWBORN

M/C → Cong Heart Disease

2nd M/C – Cong. Deafness

3rd M/C – Neural Tube Defect

LANDMARK PROGRAMMES

IMNCI (Integrated Management of neonatal, childhood Illness)

Colour Coded

Pink	YELLOW	GREEN
Most severe	OPD Rx	Least & Home Rx
Inj^n Gentamicin		
By ANM + UR.		

Referral for Admission into Hospital

IMNCI MODULE

0–2 mnths ← | → 2mnths – 5yrs.

KEY FEATURES of INDIAN IMNCI

1) Inclusion of 0-7 days in Programme

2) Incorporation of
national Guidelines on
Malaria
Anaemia
Vit A supplementation
Immunisation schedule

3) Skill Based Training

4) Training starts @ 0-2 mnths age group.
But same amount of time is devoted
to 2mnths - 5yrs. age agency

SCHOOL HEALTH PROGRAMMES

1) HEALTH DISORDERS AMONG SCHOOL CHILDREN

Dental Defects > Goiter > Malnutrition

2) Medical Exam^{n} → To be done every 6 months

3) School children Eye Screening -

a) 5th - 8th class / 10-14yr age Grp

b) Teachers Perform screening (1/150 students)

c) Visual Acquity cut off PHC Reference < 6/9

ICDS
[Integrated Childhood Development Scheme]

1) Beneficiaries → irrespective of Social Status (ICDS + JSSK)

2) Aanganwadi

3) Under 'WCD' Ministry

4) INTERVENTIONS -

SHINER He

S - Supplementary nutrition

H - Health checkup

I - Immunization

Ne - Non-formal Education

R - Referral

He - Health Education.

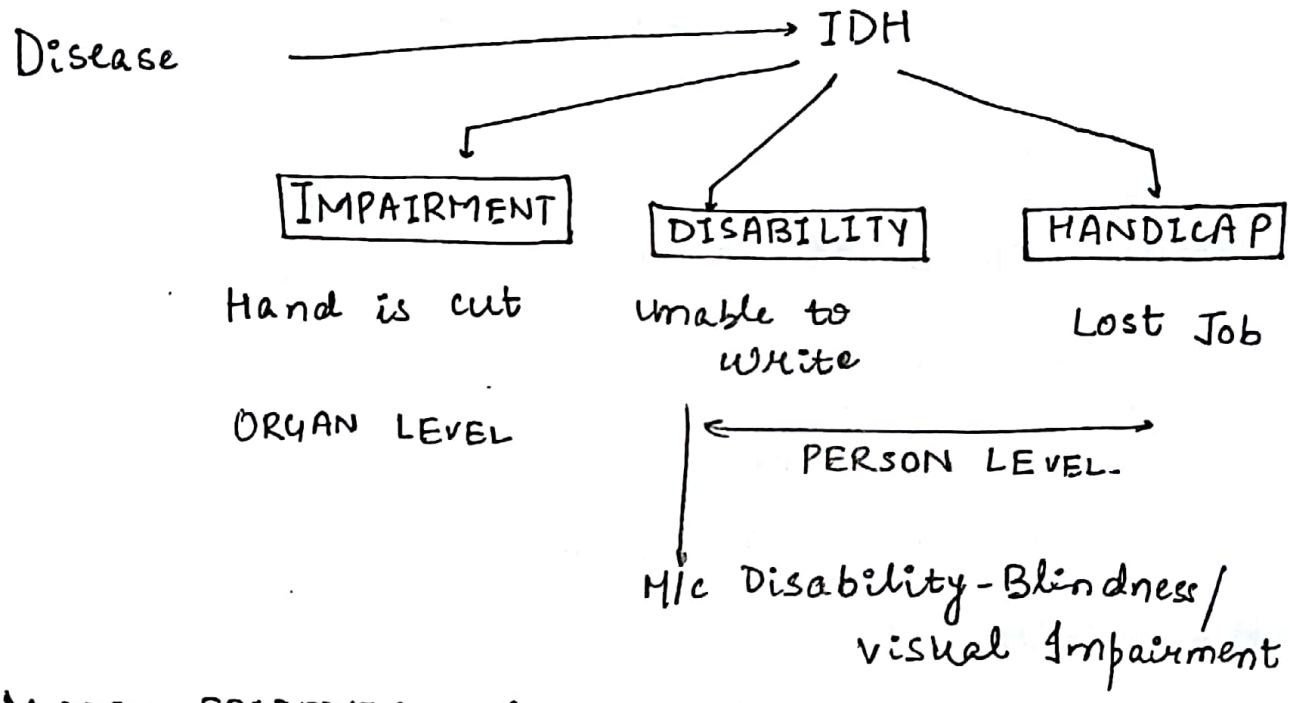
3-6 yr = SHINeR

< 3 yr = SHINER

11-18 yr ♀ - SHe

15-45 yr ♀ = He

HEALTH & DISEASES



MODERN EPIDEMIC : CORONARY ARTERY DISEASE

SILENT " — ALZHEIMER's Ds.

LITERACY-

Any person > 7yrs of age who can read, write & comprehend atleast 1 single Indian Language.

* MAX. LITERACY ⇒ TRIPURA.
* India has achieved threshold of Literacy 75%

HEALTH INDEX

SULLVIAN / DFLE → Obselete

DALY → Disability Adjusted Life Years

↳ DALY = YLL + YLD

YLD = Years of Life With Disability

YLL = Years of Life Lost due to premature mortality.

QALY- Quality Adjusted Life Years

HALE- Healthy Life Expectancy.
Best Indicator of Bureden of Disease

PQLI- Physical Quality of Life Index

	HDI (Human Development Index)	PQLI (Physical Quality of Life Index)
RANGE	0-1	0-100
VALUE	0.624 #	70
RANK	131th	

COMPONENTS

1) Life Expectancy At Birth

2) **Knowledge**
   - Mean years of expected schooling + yr. of schooling

3) Income – GDP/GPP/GNI

P
Q
- L → Literacy
- I → Life Expectancy at 1 year
- 1 → IMR

HPI :- Human Poverty Index

1) Complement of HDI

2) Developed by WHO + UN

3) HPI
   - 1 – ~~Development~~ Developing + under developed countries
   - 2 – Developed countries

4) **HPI-1** – 3 Indicators

Deprivation of

a) Knowledge ⇒ Adult Illiteracy Rate

b) Life Exp. ⇒ Probability of survival till Age of 40 years

c) Deprivation of Std. of Living :-

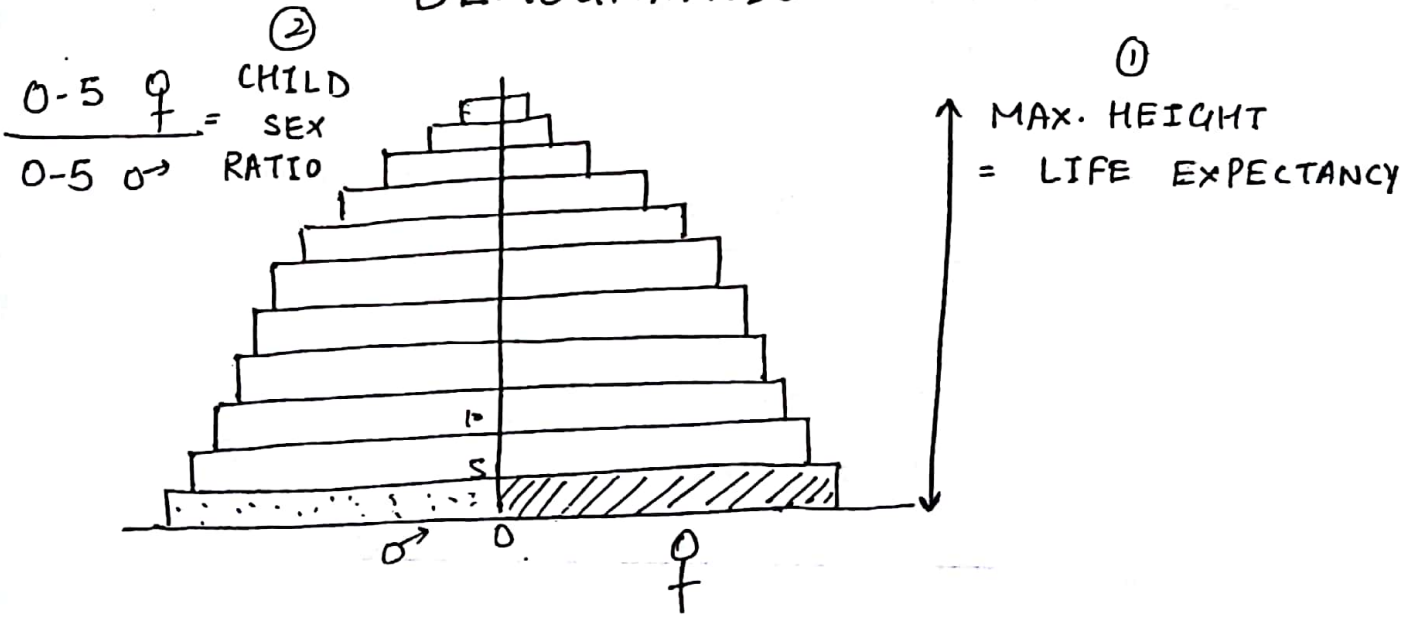
i) % Age of children underwt. for age

ii) % Age of People not using clean drinking water.

Multidimensional Poverty Index is the Best Indicator.

DEMOGRAPHY : FAMILY PLANNING

DEMOGRAPHIC PYRAMID



AGE, SEX - PYRAMID - Double Histogram

SHAPE → I & IV ⇒ Stationary

II & III ⇒ Upright / Expansive

V ⇒ Constrictive / Inverted

CRUDE BIRTH RATE

$$\frac{\text{No. of Live Birth}}{\text{No. of People / Total / Mid yr Population}} \times 1000$$

CBR = 8 x TFR +1 (simplest measure of fertility)

CBR = GFR x 0.2.

SOCIETAL DEPENDENCY RATIO

$$\frac{<15\text{yrs} + >65\text{yrs}}{15-65\text{yrs}} = \text{SDR}$$

↓ SDR = BETTER

[India is having currently having the Lowest SDR of all Times.]

HEALTH STATISTICS REPORTING

* SOURCES -

1> CENSUS - a) 1st - 1881

b.) Last - 2011

Census stop 00:00 HRS 1st March.
(Reference date + Time)

MID YEAR POPULATION - 1st July

2> **CIVIL REGISTRATION SYSTEM**

Births & deaths to be registered within 21 days

Marriage ~~in~~ in 30 days

Born outside ~~in~~ in 60 days of return to India

3> **SRS (Sample Registration System)**

CONTINUOUS ENUMERATOR

⇓

Continuous counting of Births & deaths

SUPERVISER

⇓ Births Counts & Deaths every **6 months**

* ~~ED~~ **INDICATORS**

Mortality Indicator + CBR.

↓

CBR / IMR / NMR / SBR / still

U5 MR / MMR

4> **NFHS**

National Family Health Survey

DLHS

District Level Health Survey

⟷ completed 4 rounds.

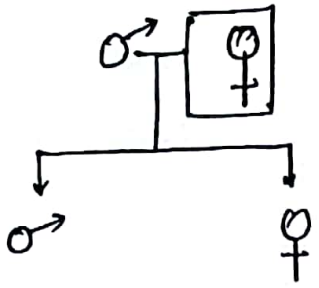
Immunization ⟷

⊕ ⊕ ⊗

NFHS - Fertility Rate (TFR, GRR)

+ Mortality Rate

FERTILITY INDICATORS



TFR = 2

GRR = 1

TFR/ TOTAL FERTILITY RATE = No. of children

GRR/ GROSS REPRODUTION RATE = No. of girls.

NRR/ NET REPRODUCTION RATE = Real Time Fertility of ♀ child

i.e. GRR + Mortality Pattern, Life expectancy

IMPORTANCE

TFR-

① Standardised Index of fertility

② Magnitude of completed family size

③ To achieve stable Population

TFR = 2.1 (called as Replacement Level)

TFR OF COUNTRY

↓ >2.1

⇓

POPULATION ↑

↓ <2.1

⇓

POPULATION ↓

NRR

① Best Indicator of Fertility

② To achieve NRR = 1, CPR = 60%.

③ TFR = 2 × GRR / NRR or ~~NRR~~

Haryana = TFR > 2 × GRR

Kerala = ~~TRR~~ TFR < 2 × GRR

GFR [GENERAL FERTILITY RATE] =

$$\frac{\text{No. of Live Birth in Given year}}{\text{No. of ♀ in 15-44 yr age grp'd}} \times 1000.$$

ASFR [AGE SPECIFIC FERTILIY RATE].

$$\frac{\text{No. of Live Birth in Specific Age Grp}}{\text{Mid year Population of ♀ of same age}} \times 1000$$

$$TFR = \frac{\sum ASFR}{1000} \times \text{INTERVAL IN AGE GROUP.}$$

ELLIGIBLE COUPLE

Married couple ♂ ♀ in reproductive age groups.

[Widow, commercial sex worker] [♀ female] ∴

↓ Not elligible ↓ elligible couple

COUPLE PROTECTION RATE

No. of elligible couples using 4 methods of contraception.

→ OCP
→ Condom
→ IUDs
→ Sterilization.

$$CPR = \frac{\text{No. of elligible couples using 4 modes.}}{\text{No. of elligible couple}} \times 100$$

EFFECTIVE COUPLE PROTECTION RATE

Condoms = 0.5

IUDs = 0.95

OCP = 1

Sterilization = 1

In a community, there are 20 elligible couples using condoms.

Effectiveness = 20 × 0.5 = 10.

CONTRACEPTIVE EFFICACY

- PEARL INDEX (P.I.) (M/c)
- LIFE TABLE (Best But complex)

$$P.I. = \frac{\text{Total Accidental } ♀}{\text{Total Months of exposure}} \times 1200$$

FAMILY PLANNING UPDATES

1) BRAND NAME OF CONDOMS IN INDIA = ASHA

2) TAG LINE = 'ACHI AADAT HAI'
[It is a good Habit]

3) PUNCH LINE = PLAN BANATE HAI
[Let's make a ♀ plan]

4) DMPA Inj^n → ANTRA
CENTROCHROMAN = CHHAYA. ~~SAHELI~~

5) M/c CONTRACEPTIVE USED IN INDIA
= ♀ STERILISATION

6) MISSION PARIVAR VIKAS = ↑ing Contraceptive Accessories in Areas where TFR >3.

NON- COMMUNICABLE DISEASE

	INCIDENCE	PREVALENCE
♂		
♀		
TOTAL		

TOBACCO -

Nicotine & CO are non- carcinogenic

CARCINOGENIC SUBSTANCES

P - Polynuclear aromatic Hydrocarbons.

A - Aromatic Amines

N - Nitrosamines

T - TAR

PREVENTIVE STRATEGIES -

1) WHO MPOWER STRATEGY -

↓

Raising Taxes (most effective)

75% of the Pack Price should be Tax

In India - 7.5%

2) PICTORIAL WARNING

WHO	INDIA
Plain Packaging of Tobacco Product	85% on Both Sides

PREVENTION OF BREAST CANCER

1> Any female >25yrs of age →
   a> monthly self Breast Exam"
   b> 3 yearly clinical Breast Exam"

2> Any ♀ >40yrs of age → annual mammography

PREVENTION OF CERVICAL CARCINOMA

♀ 1° PREVEN"

9-13yrs old ♀ (class VI) are given 2 doses of cervical Ca vaccine

2° PREVEN"

any ♀ > 29 yrs of age

↓

PHC → Visual Inspec" of ⊂ acetic acid (VIA)

↓ If ab(N)

District Hosp. - Pap smear

If (N) → Repeat Pap Smear
BEST- <3yrs
Max - <5yrs

If Ab (N) → Rx as per clinical guideline

OBESITY

NEW BMI GUIDELINES

Under wt < 18.5

Normal $18.5 - 22.99$

Over wt $23 - 26.99$

Obese ≥ 27

OBESITY ASSESMENT TOOLS

1) QUETELET INDEX

$$BMI = \frac{Wt\ (in\ kg)}{Ht\ (m^2)}$$

2) PONDERAL INDEX

Not used in India

3) CORPULENCE INDEX

$$= \frac{Actual\ wt}{Ideal\ wt.}$$

(N) ≤ 1.2

4) BROCA's INDEX

$$Ideal\ wt. = Ht\ (cm) - 100.$$

5) LORENTZ FORMULA

$$Ideal\ wt. = Ht\ (cm) - 100 - \left[\frac{HT\ (cm) - 150}{2\ (♀) \,/\, 4\ (♂)}\right]$$

SKIN FOLD THICKNESS-

1) Rapid non-Invasive method of fat assesment

2) Herpenden Skin Calliper

3) Measured at 4 site -

⇒ Med Triceps (single Best)
Med Biceps
Subscapular
Suprailiac

CUT OFFS

	♂	♀
Skin Fold Thickness	≥ 40mm	≥ 50mm
Waist Hip Ratio	>1	>0.85
Waist circumference	102cm	88cm
Waist Height Ratio (Best) < age, sex } Independent	← 0.5 →	

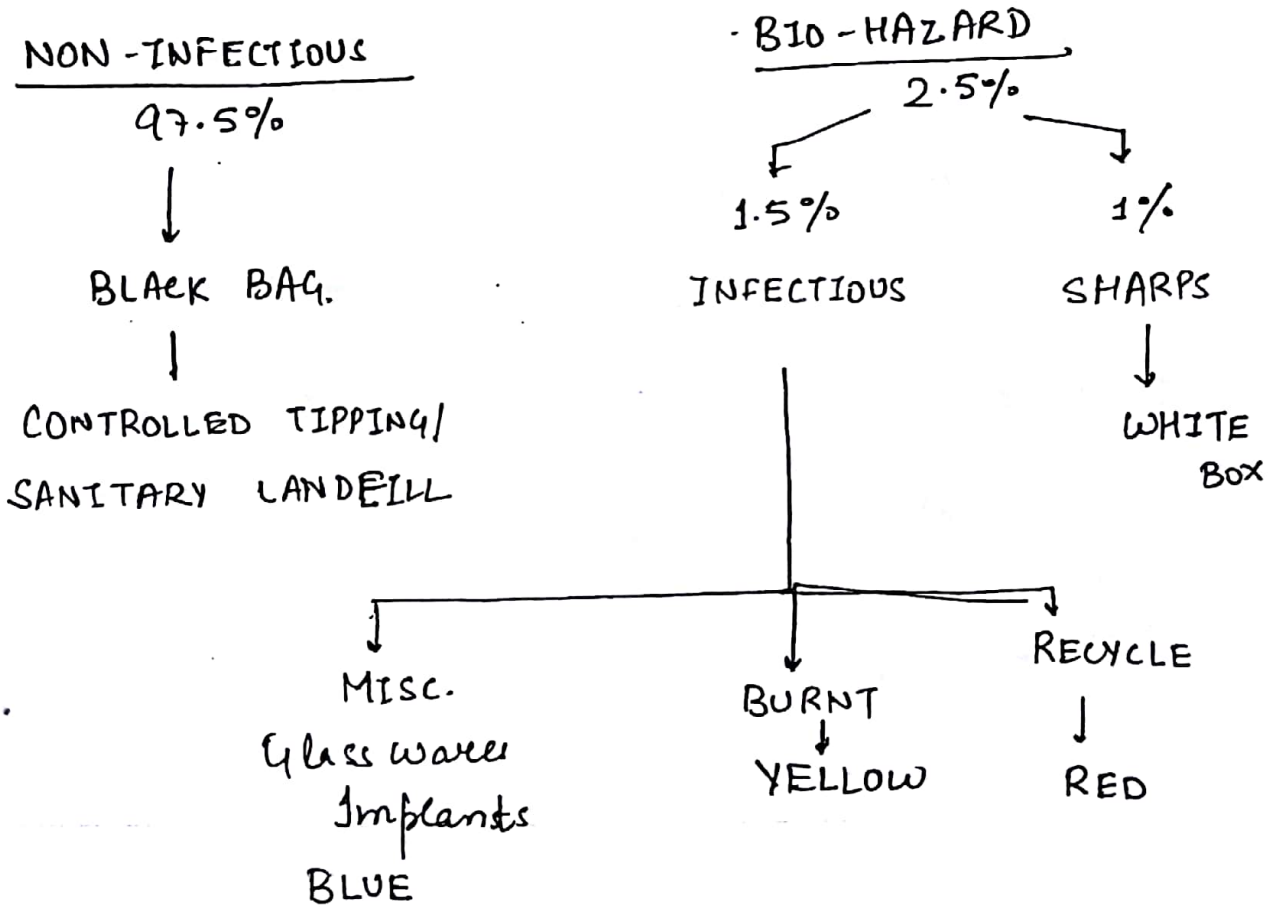
MISCELLANEOUS

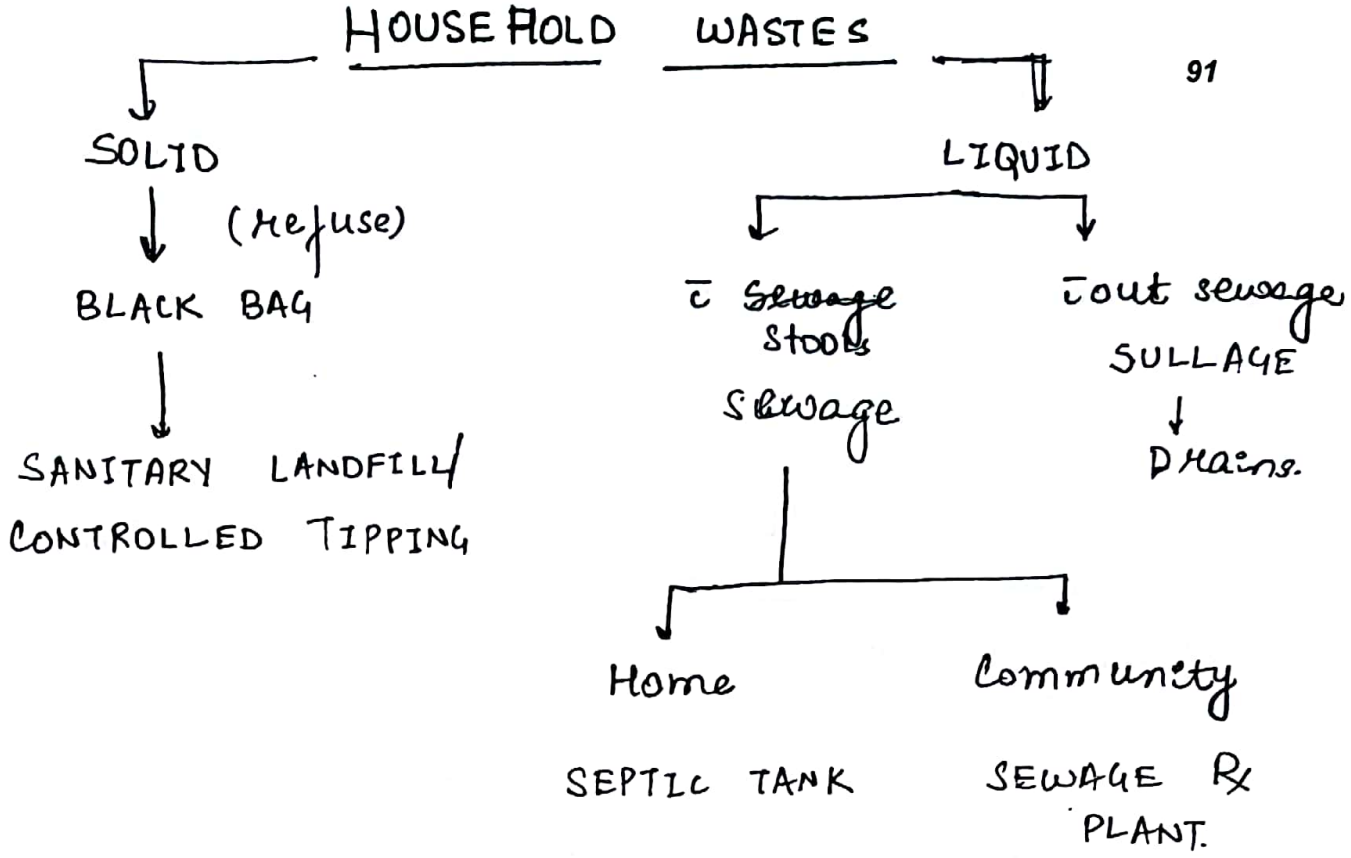
1) JAI VIGYAN - Pilot Programm for RHD

2) HADDON's MATRIX - Prevenn of Road Traffic Accident

3) STEPS - WHO NCD Surveillance of Risk Factors

HOSPITAL WASTE Mx





HEALTH PLANNING

TARGETS :- ① Discrete Activity ∈ helps to measure extent of objective attainment

② Concerned ∈ factors involved in a problem.

Ex. Revise PSM In next 5 days

OBJECTIVE :-

1) Planned Precise end point of all activities

2) Concerned with the Problem.

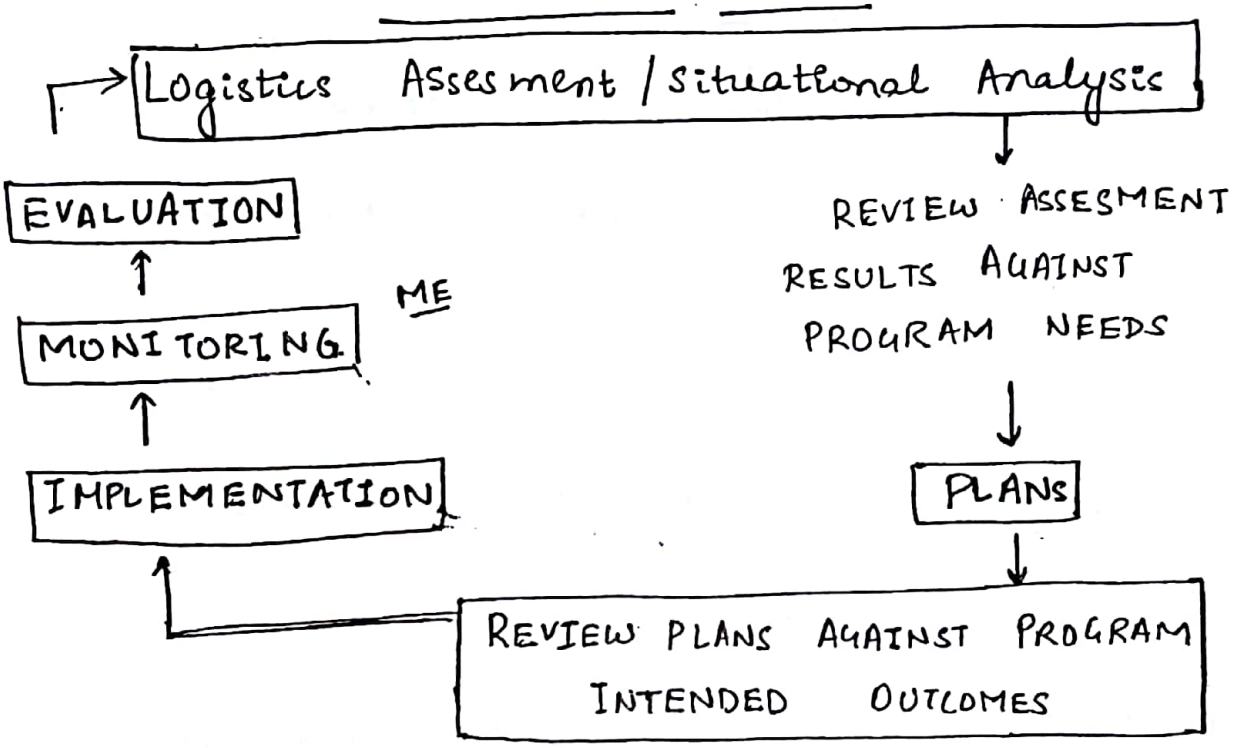
ex. Qualify neet PG 2019

GOAL:

1) ultimate Desired state to be achieved
2) may or may not be achieved
3) not constrained ī time

ex. To stay Happy

PLANNING CYCLE



MONITORING	EVALUATION
1> Int. Person	① Int. / Ext Person
2> Continuous	② Intermittent
3> what is happening?	③ How well it happened?
4> Present Tense	④ Past Tense
eg class monitor	Principal

SURVEILLANCE

Ongoing systematic collection, analyses & Interpretation of Data & Use of this Information to take Action for Prevention & Disease control.

ACTIVE

Health worker visits home of people

- Max. RESOURCES
- BEST QUALITY OF DATA

Eg. Polio
TB
Leprosy

PASSIVE

Pt. visits the hospital.

MIN. RESOURCES

POOREST QUALITY OF DATA

majority of health programme

SENTINEL

Methodology varies from Disease to Disease

OBJ -> 1) To find missing cases

2) To find trend of disease

3) Estimate total Burden of disease

Eg. HIV

BLINDNESS & MALARIA are the only 2 diseases in India to utilise all the free types of surveillance

SURVEILANCE IN MALARIA

ACTIVE

Health workers make visits the home of people. & any person who has fever in last 15 days MP slide is made

TARGET- No. of ~~fever~~ slides per year = 10% of entire population surveyed

PASSIVE

Pt visits the hospital.
Any pt. ☐ fever has to go for malaria Parasite slid.

TARGET.-
Expected
10% of entire OPD cases have fever

SENTINEL

In Hard to Reach areas & difficult areas Sentenal surveillance is performed.

Deaths due to PUO are Investigated in Detail.

QUANTITATIVE METHODS OF MANAGEMENT

1) NETWORK ANALYSIS -

Graphic Plan of all events & Activities.

PERT	CPM
Program Evaluation & Review Technique	Critical Path Method
updated Progress Report card.	Longest Path. If any activety along critical Path is delayed entire project will be delayed.

ECONOMIC EVALUATION

INPUT

Money

QUDE – cost effective

QALY (cost utility) DALY

Best for health system → DALY

OUTPUT

Money = Cost Benefit A.

QALY = Cost Utility A.

DALY = Cost Effective A.

Systems Analysis → Best M$_x$ technique to find out cost effectiveness

WORK ANALYSIS

a) DEF^n - o systematic Observation + Recording of Individual activity

b) Provides Quantitative Assesment of various activities

c) Done By ~~IT~~ companies mainly

Now started in medical sector also.

But mainly done in Junior staffs

PGI

PPBS/ PLANNING PROGRAMMING & BUDGETING SYSTEM

TRADITIONAL / INCREMENTAL HISTORIC

1) only variances in Budget from past yrs. are justified.
Baseline expenditure is automatically approved

2) Proceeds from Resource to target

3) Time is Less.

4) CORRUPTION & MONEY LAUNDERING.

ZERO PRIORITY BASED BUDGETING

1) Every item of the budget has to be justified.

2) Proceeds from Target to Resource (REVERSE DIRECTION)

3) Time is more

4) Most effecient manner of Financial management

ENTOMOLOGY

METHODS OF TRANSMISSION OF DISEASE BY VECTORS -

1) BITING - only ♀ Bite - Mosquito
Sandfly

Both sexes Bite - Tse Tse Fly

2) REGURGITATION - Housefly

3) SCRATCHING / RUBBING OF INFECTIVE SURFACE
Scabies

4) CONTAMINATION OF HOST ~ BODY FLUID OF VECTORS
Lower Animals
Ingestion

LIFE CYCLE OF MOSQUITO -

♂ = Short Lived.

♀ = 8-34 days

Larval = 5-7 days.

Egg = 1-2 days.

Adult = 2 weeks.

MOSQUITO - CONTROL

I> ANTI - ADULT-

1> ITN/LLIN

Long Lasting Insecticidal Treated Bed Nets

↓

Deltamethrin.

NO. OF HOLES/INCH^2 = 150

SIZE OF EACH HOLE OF MOSQUITO NET

= 0.043 INCH

2) IRS :- DDT, MALATHION

└ Indoor Residual Spraying

3> SPACE SPRAYING/ FOGGING - PYRETHRUM.

PREDATOR MOSQUITO [TOXORHYNCHITIS SPLENDENS] → Biological method for Aedes aegypto control

II> ANTI - LARVAL

1) LARVICIDAL → OILS, PARIS GREEN, TEMEPHOL

2) FISHES → GAMBUSIA, BARBADOS MILLIONS → Labister

3) INTERMITTENT IRRIGATION.

III> INSECTICIDES

CLASSIFICATION

ORGANO P.	ORGANO CHL.	CARBAMATES
⇓	⇓	⇓
Yheons	DDT	Carbaryl
Diazenon	Dieldrin	Propoxor
Chlorpyrifos	BHC	
	Lindane	

RESIDUAL SPRAYS-

TOXICANT	DOSAGE (gm/m²)	DURATION OF EFFECTIVENESS (months) Avg	Max
DDT	1-2	6-12	18
LINDANE	0.5	3	6
MALATHION	2	3	6

COLOUR CODING

COLOUR	TOXICITY	EXAMPLE
RED	Extremely	Zn Phosphorus.
YELLOW	Highly	Endosulphan
BLUE	Moderately	Malathion
GREEN	Slightly	Mosquito Repelants

DDT

(1) Sandfly → Insecticide of choice

(2) Pyrethrum → Synergistic Effect

(3) Zeidler → Discovered it

(4) Paul Muller → Discovered Insecticide Property
∴ Given Novel Prize

(4) Most Active form of DDT – Paraisomer (70-80%)

PARIS GREEN

Copper Acetoarsenite
only for Anopheles

ABATE

Anopheles & Aedes

MALATHION-

Least Toxic OP for Man
Most Toxic OP for Insects.

DEET-

Diethyl Toluamide (ODOMOS)

1) All Purpose Repellents
2) Anti fly / Flea / Haemophagus / Mosquito

WATER

1) MIN. DISTANCE BET' WELL & SOURCE OF CONTAMINATION = 50 feet (15 m)

2) Safe Yield of water = Adequate for (95%) of year

3) PROBLEM VILLAGE-

a> Drinking water source pt.

>1.6 km in planes

>100 m in Hilly areas.

b> Depth >15m

4) ADEQUATE WATER REQUIREMENT

a) DOMESTIC USE

URBAN	RURAL
150-160 L/p/day	40-60 L/p/day

b) DRINKING WATER. - 2-3 L/p/day

5) UNSUITABLE IN WATER-

Lead - most Unsuitable

	NITRATE	NITRITE
mg/dL	<50	<3
Contamination	remote	recent
Disease	Methemoglobin-emia	Blue Baby Syndrome

6> WATER PURIFICATION

URBAN	RURAL
Sand Filters	Chlorination

A) SLOW SAND FILTER.

Element responsible for yielding Bacteria free water → VITAL / ZOOLOGICAL / SCHUMUTZDECKE LAYER.

Present on Sand Bed surface

Made of algae / Planktons / Diatoms

Heart of slow sand filter.

Formation ⇒ Ripening of filter

* When river water is stored for 1st 5-7 days
  ↓
  Bacterial count drops By 90% due to Sunlight

* VENTURIMETER - Device used to measure Bed Resistance in slow sand filter

CHLORINATION OF WATER V.V.I.

1) ACTIVE MOLECUE ⇒ Hypochlorous acid.

2) has residual Germicidal effect
[O_3, UV have no such Property]

3) Recommended contact Period for free residual chlorine in water > 1 hr.

4) Acts Best at pH (7)

5) Fresh Bleaching powder has 33% chlorine

6) 1 CHLORINE TABLET = sufficient to chlorinate '20 L of H_2O'

7) Orthotolluidene Arsenite = measures level of both free + residual chlorine

8) Chlorine - Kills Bacteria only

9) chlorine doesn't Kill Bacterial spores,
Protozoal cysts
Helminthic ova
viral agents. (Hep A, Polio)
Cyclops.

10) Amount of Bleaching Powder Required
[CHLORINE DEMAND].

n x 2gm → Disinfect 455L of 'H_2O'

↑
No. of 1st cup ⊆ shows distinct Blue colour.

↳ Indicator = Starch Iodide

Q. 3rd cup is the 1st cup ≙ can become blue 104
How much bleaching powder required for 1820L. of water.

Ans. $3 \times 2 = 455$

$455\,L = 3 \times 2$

$1820\,L = \frac{3 \times 2}{455} \times 1820$

$= 24\,gm.$

14. HARDNESS OF WATER

- Soap. Destroying Power of water
- Hard water → Protective for non-communicable disease
- Due to Ca, Mg salts
- Softening is recommended when hardness >3 mEq/L or >150 mg/L of $CaCO_3$.

TYPES

TEMPORARY (carbonate)

HCO_3^- salts

Removal By-
- ✓ Boiling
- ✓ Lime
- ✓ Sodium carbonate
- ✓ Permutit

PERMANENT (non-carbonate)

SO_4^{2-}, Cl^-, NO_3^- salts

Removal By-
- ✓ Sodium carbonate
- ✓ Base exchange

VI BACTERIOLOGICAL INDICATORS OF WATER QUALITY

1) **COLIFORMS -**

1° ⋆ **most Reliable** Indicator of faecal Pollution.

E. Coli → Most Imp.

Faecal streptococci → **Recent** contamination

Clostridium – **Remote** contamination

2) **TESTS**

Presumptive — MPN
(most probable No)

INDICATOR → BROMOCRESOL PURPLE

Confirmatory – EIKJMANN.

BIOLOGICAL WATER QUALITY STANDARDS

In 100 mL water,

1) No sample should have E. Coli.
2) No sample should have > 3 coliforms
3) NOT > 5% samples throughout year should have coliforms
4) No 2 consecutive samples should have coliform organism.

AIR

CET / CORRECTED EFFECTIVE TEMP-

1) Imp :- Index of Thermal Comfort

2) COMBINES - Temperature
M mean Radiant heat
movement / velocity of air
Humidity

3) 'Mc ARDLE' MAX Allowable sweat Rate = $\frac{4.5L}{4 hours}$

FROM CRS

Water Quality
Sound level
Housing Std.
Types of Transmission.
Vector : Disease Transmitted
: Mosquito.
Disease by Ticks.
Insecticides

VENTILATION :

1) SPACE = fresh air. supply of 3000 ft 3/ HR / Person.

2) Air change = → 2-3 changes / HR. (living room)
→ 4-6 changes / HR (work Place)

GLOBAL WARMING :-

Due to Green House Gases

1) Water vapour → Highest

2) CO_2 → 2nd Highest – Measured by KIFFER's TEST

3) O_3 → Protective , CFC → Depletor

AIR POLLUTION

1) Max in winters (Due to Temp Inversion)

2) Best Indicator of air Pollution.
   a) Chemical → SO_2
   b) Biological → Lichens

3) AQI- (air quality Index).
   ~~8 ID~~ 8 INDICATORS

   DARK GREEN – GOOD
   MAROON – severe

4) Air Quality is monitored by CPCB (central Pollution Control Board)

5) WHO Annual $PM_{2.5}$ Guidelines = 10 $\mu g/m^3$. 108

particulate (2.5 μm) matter (most dangerous)

OVERCROWDING

⇒ AGE = 0-1 yr = 0

1-10 yr = 1/2

> 10 yr = 1.

⇒

AREA (ft^2)	PERSON
110	2
90-100	1.5
70-90	1
50-70	0.5
<50	0

⇒

ROOMS	MAX NO. OF PERSONS
1	2
2	3
3	5
4	7
5	10

NUTRITION

OBSOLETE :-

① NPU / BV / PER
② Food Pyramid
③ PFA, AGMARK, ISI
④ BALWADI Nutrition / special Nutrition Programme
⑤ ~~Bfd~~ Balanced / Prudent Diet

HEALTHY DIET -

WHO Definition of 2015.

	ADULTS	CVS DISEASE
Total fats	< 30%	< 20%
Saturated fat	< 10%	< 7%
Sugar	< 50 gm/day	< 30 gm/d

Dietary cholesterol < 200 mg/d
Chl./HDL Ratio < 3.5

Salt Intake . < 5 g m/day
400 gm (5 portion) of fruits . veg - a day

DISTRIBUTION OF CALORIES IN (N) DIET -

Carbohydrate → 55-65%
Protein → 15-20%
FATS → 20-25%

Elderly	↑ Fibre, Iron, Calcium	↓ carbohydrate energy	same fats coil

↓ by 5% after 4th decade & 10% after 6th decade

DIETARY FIBRE

RDA Normal = 40mg/dL

RDA Diabetic = 48 mg/dL

RDA

97.5% population

Never eliminate calorie intake as per RDA

EAR (Estimated Avg Requirement)

50% population

PROTEIN ASSESMENT

Best Indicator – DIAAS [Digestibility Indispensable Amino acid score]

Most accepted – PDCAAS [Protein Digestibility corrected Amino acid score]

INDIVIDUAL FOOD STUFFS

1) SOYABEAN

⇒ Richest Pulse

43% Protein (Quantity ↑) But utilization (55%)

⇒ Poor Quality

⇒ Limiting AA = methionine

⇒ Richest Source of → Calcium
→ Iron
→ Vit B

(II) Eggs

1) Utilization ~ 96% ≈ 100% (Reference Protein)

2) 6 gm of protein
6 gm of fats
30 mg calcium
1.5 gm Iron
250 mg Cholesterol

3) Wt. = 60 gm. Energy = 70 kcal

4) Richest source of cholesterol

5) Poor source of Vit C & Carbohydrates.

(III) FISH

1) Richest source of Vit A, D.

2) Rich source of proteins, calcium, phosphorus, flourde, ~~Iodine~~

3) Poor source of Carbohydrate & Iodine.

(IV) Banana.

1) Good source of Vit A, B_6, C, Carbohydrate, Energy, fibre, Potassium, Phosphorus

2) Not a good source of Iron, calcium, Zinc due to phytates

IODINE

1) RDA_{NORMAL} = 150 µg/d

$RDA_{♀}$ = 250 µg/d.

$RDA_{Lactation}$ = 290 µg/d

2) As per FSSAI,
Amount of Iodine @ point of production = 30 ppm
& @ point of consumption = 15 ppm

3) Iodised oil – Poppy seed oil
(production for 4 years)

4) DFS / 2 in 1 salt ⇒ Double fortified salt
40 µg Iodine + 1 mg Iron / Gm of salt

5) Iodine Def. is a matter of major public health problem when Goiter prevalence >10%

6) Iodine Def. leads to ↓ in IQ By 13 points

7) Global 100 Day : 21st October

8) Endemic Cretenism = when Iodine uptake is < 20 µg/dl

9) KI ⇒ used for Iodisation.

FOOD STANDARDS

GLOBAL	INDIAN
↓	↓
Codex alimentarius	FSSAI (food safety - Std authority of India)
(Int Govt Body of FAO + WHO)	

FORTIFICATION

1. Small amount
2. Daily consumption
3. salt Iodisation
   Vit A + D in Vanaspati
   2500 IU / 175 IU / 100 gm of vanaspati

SUPPLEMENTATION

1. Large amounts
2. Intermediate consumption
3. Vit A supplementation.

MID-DAY MEAL PROGRAMME

1) PRINCIPLE - 1/3rd of carbohydrate + 1/2 Protein.
2) MINISTRY - Human Resource + Development
3) Minimum - 150 days / year
4) 1° SCHOOL → 450 kcal
   → 12gm Protein
5) Upper 1° → 700 kcal
   → 20 gm Protein
6) Age Group - 9-12 years
7) upto class 8

Images + Mug-ups

PART- 3

VACCINES

FULLY IMMUNISED CHILD

child <1yr of age who has received 1 Dose of BCG

3 doses of DPT, OPV, Hep B

1 dose of Measles.

BENEFIT:- Provide max chance of survival

INDIA has largest no. of unvaccinated children

Drop out = Total - not fully immunised

VVM (VACCINE VIAL MONITOR)

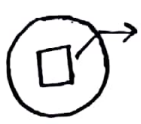
1) IMPORTANCE- a) Direct marker of heat exposure & effeciency of cold chain.

b) Indirect marker of potency of vaccine

2) Direct Relationship bet^n

Rate of colour change ∝ Temp.

⇒ Lower Temp ⟶ slower rate

3)  → 10% of area of outer circle Temp. sensitive material.

4> Ex. of Nominal Scale < Usable / non-usable

5> Validation → Optical Densitometer

MISSED DOSES

1) If a single dose is missed

a) No need to restart vaccine schedule again

b) Give the missed at earliest opportunity

Eg. 6wk → DPT 1, OPV 1, Hep B-1

10wk → missed

Came at

12 wk → DPT 2, OPV 2, Hep-B2

↳ Next dose of 14wk given at 16 wk

2) If not a Single Dose is Taken.

<1yr → Give as per NIS

NEW GUIDELINE

	1-5yr	> 5yr [DPT causes urological Ab(N) in >5yr]
1st visit	OPV, DPT, Hep B	dT / TT, Hep B
2nd visit (after 4weeks)	OPV, DPT, Hep B	dT/ TT, Hep B
3rd visit	OPV, DPT, M/MR	M/MR

1yr Later	1-5yr	>5yr
	OPV, DPT, HepB	Hep B

COLD CHAIN (Storage of vaccines)

DISTRICT/ PLACE OF PRODUCTION → (COLD BOX) → CHC/ PHC → (DAY CARRIER) HOUSE TO HOUSE; (VACCINE CARRIER) SUBCENTRE

- DISTRICT/ PLACE OF PRODUCTION → WIC [WALK IN COLD RM]; LARGE ILR's (Ice Lined Refrigerator); (Store for 3 months)
- CHC/ PHC → Small ILR's (Store for 1 month)
- SUBCENTRE → No vaccine storage

MAX. Damage to vaccine occurs in SUBCENTRE or VILLAGE LEVEL

DEEP FREEZER

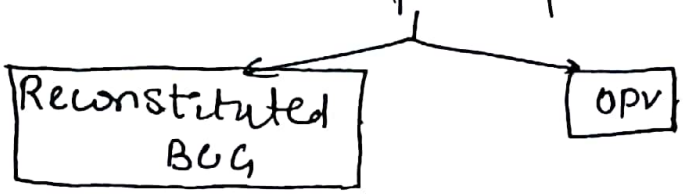
- PHC/CHC → Prepare Ice Packs
- Dist Hosp. → Preparing Ice Packs + storing vaccines like OPV & BCG for long Time Periods

ICE PACK-

1) Prepared in deep freezer

2) 320 mL In capacity, Horizontal Mark, Water is filled, nothing else to be added.

3) 2 Holes on surface for



4) Day carrier → 2 Ice Packs
Vaccine carrier → 4 Ice Packs

ILR (ICE LINED REFRIGERATOR)

1) With an uninterrupted Power supply of 8hrs, ILRs an maintain Temp for 24hrs

2) Instrument & we use is k/a DIAL THERMOMETER

3) Measured twice a day, even on Holidays.

PRINCIPLE
Thermo-couple

4) Temp +2 to +8°C

5) ~~SEQUENCE~~

SEQUENCE OF STORAGE –

Top

Diluents	De
Hep B	Humein
IPV	Itni
Penta	Permanent
DPT	Daya
TT	Teri
BCG	Bhagwan
Measles	Mere
OPV	OH

Temp. ~~Seen~~ Sensitive

Reconst BCG > Yellow fever

Bottom.

OPEN VIAL POLICY

Reconstituted vaccine

↓

+ ROTA

↓

BCG, Measles, JE

(Yellow fever, Rabies)

↓

NEVER REUSED after 4hrs of Reconstitution.

Other vaccines

↓

If VVM is intact then can be used till 28 days

AIIMS

eVIN · (Electronic Vaccine Intelligence Network)

'SMS' Based Temp. Monitoring Sense System where ILR is connected to a computer & sends messages In case of Temp. Fluctuation To Medical officer Incharge + District Immunization officer Numbers.

" Lowest Level It is Being Used is PHC"

NATIONAL VACCINE REMINDER

AIIMS

1) Free SMS Service
2) Where child's name + DOB are sent to helpline No.
3) Reminder for vaccination of child is received '2d' In advance
4) continued till child is 12yrs old.

WASTAGE MULTIPLICATION FACTOR (WMF)

BCG → 2

RoTA
Measles } → 1.33
JE

Others → 1.11 ~~1.15~~

AIIMS

VER (VACCINE EFFECTIVENESS RATIO)

VER = 1 - RR

(Relative Risk)

IPV

India started ē 0.5mL I.M. Dose of IPV single Dose at 14wk

↓

Now we gave fIPV (fractionated IPV)

0.1mL I.D. 2 doses of IPV at 6 & 14wk

VIT A Supplementation

<1yr = 1 Lakh IU/1mL

>1yr = 2 Lakh IU/2mL

9 month → 1mL given

After every 6 month till 5yrs we give Vit A 2mL/2 lakh I.U.

Total = 9 Doses

1x1 + 8x 2 = **17 lakh IU**

BCG

1) DANISH 1331 Strain
   Mycobacterium Bovis

2) DOSE = 0.1 mL
   < 1 month = 0.05 mL

3) Route - I.D. (Tuberculin Test)

4) Site = (L) Upper arm

5) Diluent = NS

6) ADVERSE Rxn - Ulceration
   Suppurative Lymphadenitis
   osteomyelitis
   Disseminated T.B.

DPT/DT

1) DT- Toxoids P → killed acellular

2) $AlPO_4$/AlOH (Adjuvent - ↑ses Immunogenicity)

3) THIOMERSAL (Preservative)

4) Route - I.M. 0.5 mL middle part of Anterolateral thigh

5) ADVERSE Rxn- neurological
   Shock

C/I → a) Severe Rxn in previous dose upto 48 hrs. after vaccina.

a) ~~Screaming~~ Screaming

b) Fever > 40°c

c) Neurological

MEASLES

1) EDMONSTRON ZAGREB

2) Diluent - Sterile/ Distilled water

3) Stabilizer - Sorbitol.
Neomycin,
Hydrolyzed Gelatin.

4) Route - 0.5 mL S.C (R) arm

5) C/I - High Fever
Anaphylactic Rxn

♀

7) Complication - TSS
ITP.

VACCINATION IN ELDERLY

NO GUIDELINES IN INDIA

1) Influenza I.M. (live attenuated - C/I)
2) Pneumococcal (single Dose)
3) dT Booster (every 10yrs)
4) High Risk Pt
   a) Shingles/ Zoster / varicella
   b) Hep A & B
   c) MMR
   d) Meningococcal
   e) yellow fever

GENERAL GUIDELINES

a) All 'LA' vaccines are C/I in ♀ except

Yellow fever
OPV
Cholera
} Travel/ outbreak + Rabies

2) Any vaccine (except OPV & Yellow fever) if accidently frozen are discarded

3) Any no. of vaccines (live or killed) can be given together (no need for any form of gap)

4.) ND spirit is to be used to clean vaccination site

5) Minor fever, Diarrhoea are not C/I for vaccination

acute resp. Infn

~~HIV~~ HIV

PPTCT

Prevention of Parent to child Transmission of HIV

MOTHER

If a ♀ is on 'TEL' Therapy from 1st Trimester no need to go for Prophylactic LSCS. (unless obstetrically Indicated)

CHILD

1) Nevirapine Prophylaxis start at Birth.
   Min - 6 weeks
   Max - 18 months

2) Cotrimoxazole Prophylaxis Therapy
   Start → 6 weeks
   Continue → Till clinical discretion.

3) Exclusive Breast Feeding for 6 months.
   ↓
   Abrupt stop
   ↓
   Switch to artificial feed
   No ♯ mixed feeding is allowed

* In India, there is no C/I for Breast Feeding

4) Early Infant Diagnosis
Done using HIV DNA PCR + Confirm" of HIV -ve status of child is done only @ 18 mnths

POST- EXPOSURE PROPHYLAXIS

→ Any Person who has come in parenteral or mucosal contact ~ Infective secretion of Body (all secretions of human Body is infective except Urine, sweat, tear & not blood stained saliva)

→ PEEP to be Started as soon as possible. (Max 72hrs)

→ Given till 28 days

→ Confirm" of HIV status can only be done at 3 months.

REGIMEN

>10 yrs - Adults
↓
TEL

<10 yrs
↓
ZIDUVODINE/TENOFOVIR + LAMIVUDINE + RITONAVIR/ LOPINAVIR.

Ziduvodine Based Regimen is Preferred

HIV Rx IN INDIA

India now follows TEST & Rx POLICY
i.e. There is no cut off for Initiating HIV Rx In India.

CD_4 is only used for monitoring Reponse to HIV Rx.

HIV pt ⟶ CD_4 Every 6 month

HIV + TB pt → CD_4 done every 3 month

≥ 3 yr → Adults
↓
TEL

< 3 yrs
↓
LOPINAVIR/
RITONAVIR.

HIV Rx SERVICES UNDER PROGRAMME-

ART+	Select Medical college	3rd Line ART + CD_4 Count
ART	All medical colleges + Dist' Hospital	1st Line ART + CD_4 Count
LAC Link ART CENTRE	All Subdistrict Hosp + CHC ~~PHC~~	1st Line ART

NATIONAL STRATEGIC PLAN FOR HIV/AIDS & STI

2017 - 24

VISION - Paving way for AIDS free India

GOAL - '0' new Infec".
'0' AIDS Related Deaths.
'0' Discrimination.

TARGETS -

By 2020	By 2024
① 75% Reduc" in new HIV Infec"	80% Reduction in new HIV Infec".
② 90-90-90	95-95-95

90% of people who are HIV +ve know their **Status**

90% of people who know the Status are on **HIV Rx**.

90% of People who are on HIV Rx should have viral **Load suppression**

③ Elimination of **Stigma** + Discrimination

④ Elimination of **PTCT** of HIV + Syphilis

HIV SENTINAL SERVICES (2016-17) 130

PREVALENCE OF HIV INF^{n}

100 ⟶ 6.26%

ANC CLINIC ATTENDES ⟶ 0.28%

3 GROUP OF POPULATION

HIGH RISK GROUP	BRIDGE POPULATION	GENERAL POPULATION
⇓	⇓	⇓
Injec^{n} Drug user	Long Distance	ANC
Trans-Gender	Truck Driver	
Hijaras	Single migrant MEN	
Men having sex ĩ men		
Commercial sex workers.		
(n) 250	250	400
Sampling Random	Consecutive	Consecutive

TESTING STRATEGY

Linked Anonymous 2 TEST STRATEGY

POLIO

POLIO ELIMINATION STRATEGY-

HISTORICAL

① Routine Immunisation (RI) → under NIS

② Supplementary Immunization activity (SIA)
→ Pulse Polio
(0-5yrs)

③ AFP surveillance
(0-15yrs)

④ MOP UPS → Difficult areas

NEW / END GAME

① SWITCH [2016]
tOPV → bOPV
Type 2

② SHIFT (2018)
OPV — IPV

③ Continue AFP surveillance

V.V. Imp

VAPP
[Vaccine associated Paralytic Polio]

Rare
Less Dangerous
Doesn't cause outbreak

Due to Type 3 strain

PATHO - OPV is a Live attenuated Vaccine & in it vaccine virus converts to wild ~~variety~~

VDPV
[Vaccine derived Polio Virus]

Rarer
More Dangerous
Causes Outbreak
(cVDPV)
↳ circulating
Due to Type 2 strain

Unknown But commonly seen in areas of low

Variant & causes Paralysis

SOLUTION - ~~Sto~~ shift (2018)

Vaccine coverage

switch (2016)

ACUTE FLACCID PARALYSIS

DEF^{n} - Onset of Paralysis c is < 4 weeks in onset (Acute) leading to flaccid/floppy limbs

CAUSES -

4 causes

1) Acute Paralytic Polio
2) Transverse Myelitis
3) Traumatic neuritis
4) Guillian Barre Syndrome

TIMELINE -

1> c in **2 days** of notification AFP **Surveillance** has to be done
2> c in **2 weeks** of **onset** of Paralysis
3> Checking for **residual Paralysis** has to be done after **2 months** ~~of~~ onset of Paralysis

STOOL SAMPLE COLLECⁿ-

→ 2 samples 24 hrs ~~after~~ apart are collected each sample being 8g in amount (Size of distal phalanx of the thumb)

→ is collected in a clean, dry, screw capped container containing no preservative.

→ Transported in Red coloured vaccine carrier (Temp. of +2 to ±8°C) [Reverse cold chain]

INFECTIVE EPIDEMIOLOGY

EPIDEMIC ⇓ > Mean + SD. even a single new case of new/ eliminated/ eradicated Disease

- Point source — Rapid Rise, Rapid fall, 1 incubation Period, clustering of cases
- Propagated — slow rise, slow fall, multiple I.P.

ENDEMIC ⇓ < Mean ± 2SD

- HYPERENDEMIC — Only in paediatric population
- HOLOENDEMIC — All age grps are equally affected

PANDEMIC ⇓ >1 country involved at a time

PART- 4

DISASTER

1) DEF^{N} :- Extra-ordinary Response from outside

2) M/c DISASTER / MAX FATALITY -
Hydrological (cyclone + Flood)

3) Dis. c Max Morbility / Mc DIST. POST DISASTER
Aute Gastro enteritis.

4) M/c Vit. Deficiency Post Disaster
Vitamin A

5) Most Preventive Strategy for AGE -
a) clean drinking ~~Post~~ water
b) SAFE Disposal of stores.

6) Clean Drinking water
is ensured by Chlorination

* Amount of Residual Chlorine

(N) Drinking water — 0.5 ppm

Post Disaster water — 0.7 ppm

7) Potassium Iodide → Drug to be consumed prophylactically Post Natural ~~Disaster~~ Disaster

↓

Replaces Radioactive 'Iodine' from Thyroid Gland

8) TRIAGE CLASSIFICATION OF DISASTER

BLACK - Dead - Least Priority

RED - Max. ~~Priority~~ Priority → Rx In 4-6 hrs

YELLOW - Intermediate → Rx In 24 hrs

GREEN - Ambulatory Pts.

Reverse Triaging :- GREEN (Max Priority) in Defence/ wars.

9) VACCINES TO BE GIVEN

DISASTER VICTIMS (After Disaster)

⇓

Measles
+ VIt-A
Chicken pox
ROTA

* Typhoid & Cholera Usefess

DISASTER RELIEF TEAM (Before Disaster)

⇓

Hep B
Tetanus
Typhoid
Cholera

NODAL

HEAD → PM

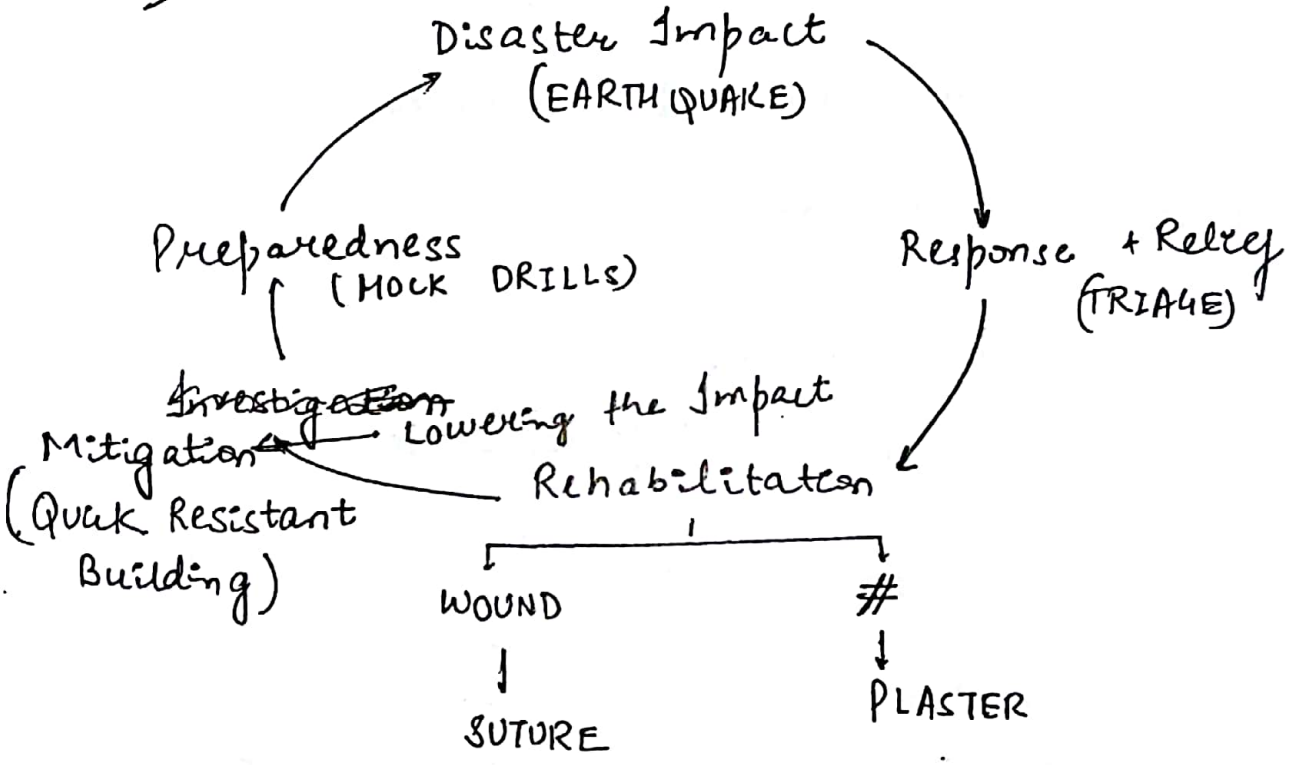
Ministry → Home

Agency → National Disaster Mx agency/ authority

Health Unit → District

PGI

DISASTER CYCLE



INTERNATIONAL HEALTH

UNICEF

GOBI FFF

G - ~~Growth~~ Growth Monitoring

O - Oral Regulation

B - Breast Feeding

I - Immunisation

F = Female Educ°

F - Family Planning

F = Food supplementation

HQ	ORGANISATION
GENEVA	WHO, International Red. cross, International Labour Organisation
NEW YORK	UNICEF, UNPP
ROME	FAO (food & Agriculture Org°)

ERGONOMICS → Right Man In Right Job

NOSOLOGY → Classification of Diseases

EMPORIATRICS → Study of International Disease of Travellers

UNDP → Development

UNFPA → Family Planning, Reproductive Health.

WORLD BANK - Economic Loan.

WHO

① 07/04/1948 → constitution of WHO adopted ∴

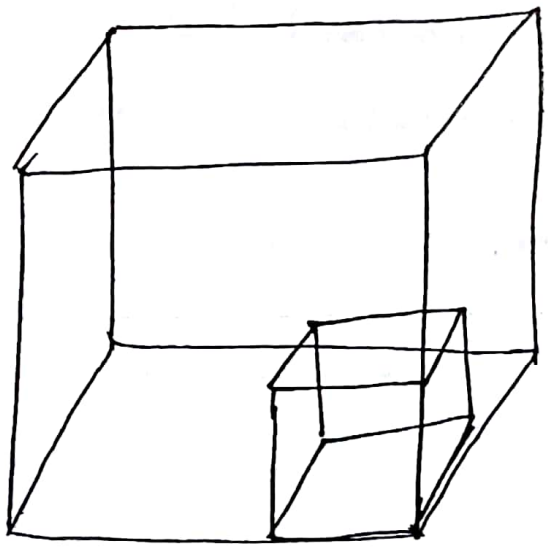
② ∴ celebrated as WORLD HEALTH DAY

↓

2018 (THEME) :- UNIVERSAL HEALTH CARE

↓

3 COMPONENTS



→ ↑ coverage to no. of people served

→ ↑ coverage of services being provided

→ ↓ cost

3) OLIVE LEAF - Emblem of WHO

4) WHO has 6 Regions
India come in South East Asian Regions [SEAR]

5) SEAR has 11 countries → India + neighbours (NO PAKISTAN)

COMMUNICATION

Most Imp. Component = FEEDBACK / EFFECT

TYPES

ONE WAY	TWO WAY	FACE TO FACE
DIDATIC	SOCRATIC	1 to many / 1 to 1
↓		Advice / Counseling
T.V., Internet	Focussed Group Disc' (FGD), workshop, Pannel Discussion, Symposium	Max. Resources
News Paper		Min. audience
Min. Resources		Max. Behaviour change
Max. Audience	INTERMEDIATE	
Min Behaviour change		

ADVICE → ONE TO MANY

COUNSELING → ONE TO ONE

↳ ~~Gather Approach~~. G.A.T.H.E.R.. APPROACH

↓

Emergency contraceptive Pill

TWO-WAY

I) FGD

a) Min = 6 participitants

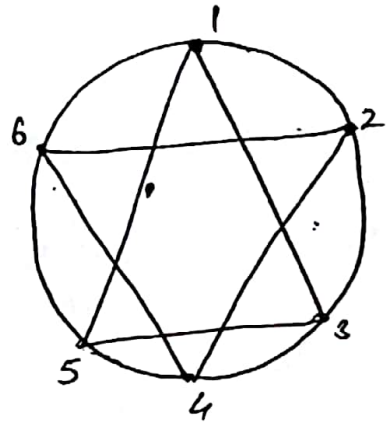
b) Max = 12 ,,

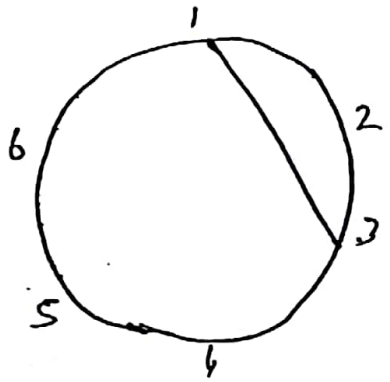
c) should know each other from before

d) should discuss on the same issue

e) SOCIOGRAM

a) Provides detail of Participatione of Participants





(II) WORKSHOP

a) Practical skill Development Demonstratoy Place

b) 30-40 participants.

c) Cataract

d) Laproscopic workshops.

(III) PANEL DISCUSSION ⟷ (IV) SYMPOSIUM

is sequential

[3-4 Participants who discuss in front of a large audience]

AIIMS, PGI

DELPHI'S METHOD

1) Systematic Interacting & forecasting method

2)
   a) Group of Experts
   b) Independent
   c) Geographically Dispersed
   d) Brought to a consensus

3) Ex:- Dengue

SOCIOLOGY

1) ACCULTURATION -
Mixing of 2 cultures

2) OPINION - Temp. Subjective view
BELIEF - Permanent subjective view
ATTITUDE - Permanent Objective Acquired
HABIT - Accustomed Acquired automatic way of doing a thing

3) LEVELS OF LEARNING -
COGNITIVE - knowledge → H/C Q. (lowest level)
AFFECTIVE - Attitude
PSYCHOMOTOR → Skills → HIGHEST (USMLE step III)

4) TYPES OF FAMILY - CENSUS DEF^{n}.
a) NUCLEAR - MA + PA + Bacha
b) JOINT - 2 Eligible Couple
c) EXTENDED - Nuclear + Any extra family member
d) NEW - Nuclear & (10 yr of marriage.
(Imp. for family planning)

5) SOCIO ECONOMIC STATUS
URBAN
MODIFIED
KUPPUSWAMI
RURAL
UDAI & PAREEK

URBAN MODIFIED KUPPUSWAMI

Income of Family
+ Education + occupation of head of household

~~BEFO~~

6) BELOW POVERTY LINE

Amount of Money required to buy 2400 kcal/day
In RURAL. → 32 Rs/day.
or
2100 kcal/day In Urban → 47 Rs/day.

I) SOCIAL PATHOLOGY

→ It is the study of Relationship Between Disease + Social Factors

II) SOCIAL SECURITY- BISMACK (Germany)

Social Assistance	Social Insurance
Non-contributory Benefit	Contributory Benefit
Extended to vulnerable Population	Extended to Individuals
Ex- Old age / Widow/ Disability Pension scheme	Ex- LIC, ESI

III> SOCIAL SAFETY NET –

Collection of services provided by Govt. & prevents Individuals from falling into Poverty

INCLUDES – welfare,
Employment
Universal Health care
Shelter homes

IV> SOCIALISED MEDICINE–

Govt. provides all aspects of healthcare
(JULES GUERIN, Russia)

- Pt. Doesn't Pay any amount
- Employs all DR's
  - Stds. of care maintained.
  - No private practice
  - NO competition

UNIVERSAL HEALTH CARE

OCCUPATIONAL HEALTH

M/C occupational D/s in India ⇒ LUNG DISEASE

Q. Lung Disease → Pneumoconiosis → Silicosis. → Occupational Cancer → Skin cancer > Lung ca

OCCUPATIONAL HEALTH EXAMINATION

PRE PLACEMENT

⇓

① ERGONOMICS
(Right man in Right Job)

② Occupational Dermatitis

POST PLACEMENT

⇓

1) Annual - Majority

2) Monthly - Lead
Radium
Dyes.

FACTORIES ACT 1948

1) Factory is an establishment
≥ 10 persons + usage of electricity
or
≥ 20 persons

2) 29 Diseases are notifiable
a) all pneumoconiosis [except Bagassosis]
b) all occupational carcinomas

3) Work Related NORMS_
a) AGE - <14 yrs - Prohibited

15-16yrs - Declared fit by Dr. can only work Between 6am - 7pm

B) HOURS OF WORK

15-16yrs - Max 4.5 hrs/d

Adults - 9 hrs/d

60 hr/week including overtime

C) HEALTH, SAFETY & WELFARE RECOMMENDATIONS-

Min - 500 ft^3/worker

1 safety officer / 1000 workers

1 welfare officer / 500 workers.

1 canteen > 250 workers

1 creche > 50 ♀ workers

ESI (EMPLOYEES STATE INSURANCE) 1948

1) INCLUDES

a) all factories

b) all educational institutions (Both govt & private.)

c) Restaurants & Hotels

d) Cinemas & theatres

e) Newspaper agency

f) Road motor Transport

EXCLUDES

Mines

Defence

Railways

② Covers all employees earning < 21,000 /mth. #

③ Union ministry of Labour

④ Employer - 4.75% of Total wage
Employee - 1.75% of Total wage

⑤ ESI BENEFITS :-
from CRS

RNTCP

Ministry change:- RNTCP has been transferred to additional secretory & director general of NACO

TB NOTIFICATION -

1) On 7/5/2012. GOI made it mandatory to notify TB cases
2) ī in 1 month of Δ to District TB officer (DTO)
3) In 2018, Govt. Declared failure to do so is a criminal offence under sec 269 & 270 IPC with 6 months - 2 years of imprisonment ī/ī out fine

NATIONAL Strategic Plan for TB elimination (2017-25)-

1) Vision → TB free India
2) Goal → To achieve rapid ↓ of T.B. Burden, morbidity & mortality By 2025.
   DTPB approach [Detect Treat Prevent Build]
3) Expected outcome- By ~~2025~~ 2025,
   a) 80% reduction in TB Incidence
   b) 90% ↓ in TB mortality
   c) 0% pt having catastrophic expenditure due to TB

FINANCIAL INCENTIVES

→ Every TB pt will receive 500 Rs/month for purpose of meeting TB related expenses

→ 1000 Rps/pt one time ₹ is provided for notification.

RT-MERM

→ Real Time Medication Event Monitor Device

→ This records date & time of Mx intake by patient & provides details about adherence to TB Rx

HIV-TB Rx

5 Interventions-

1) Δ using CB NAAT only

2) Daily fixed Dose combination

3) 99 DOTS

4) Pharmacovigelance

5) Isoniazid Preventive Therapy →

- every HIV pt is given 10 mg/kg of Isoniazid

(In India, ~~IGH~~ TB is M/c Opportunistic Infec" in case of HIV pts)

* In case of HIV TB co-infec" we always start ℂ TB therapy 1st for 1st 15 days & to avoid Immune Re-constitution Syndrome

TB Rx

Intensive
4 FDC
Anti-TB schedule
9 drug

Continuation
3 FDC
Anti TB schedule
10 drug
smaller ϕ tablet

* There are 4 wt bands for Adult Rx starting from 25kg
whereas in pediatric age group – 6 wt. bands ranging from 4 to 39 kgs.

* In case of pediatric age group if there is a change in wt band than dose of TB medicine has to be modified.
But not done in case of adult

DOSING

H – 75mg
R – 150mg
Z – 400mg
E – 275mg

DRUG SENSITIVE NEW

$2(HRZE)_7$ +

$4(HER)_7$

DRUG SENSITIVE Previously Rx

$2(HRZES)_7$ +

$1(HRZE)_7$ +

$5(HER)_7$

GOALS OF RNTCP

Cure | Prevent Resistance | Break chain of Transmission

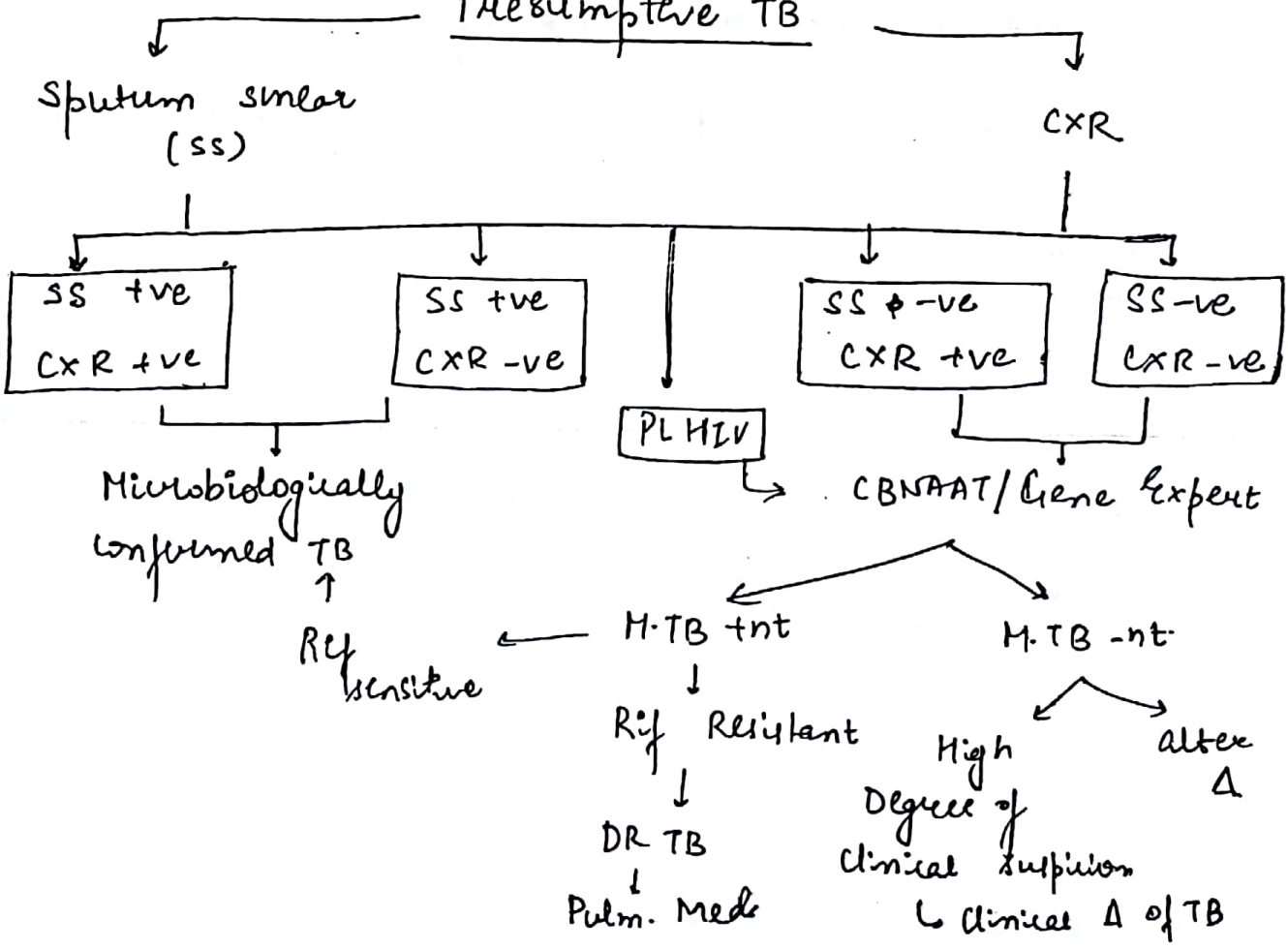
TARGETS

Detection - 90%

Cure Rate →

Drug sensitive New = 90%

Drug sensitive Previously Rx = 85%



CASE DEFINITIONS :-

Microbiologically

Presumptive TB pt. AFB/ Culture +ve/ CBNAAT +ve

Clinically Aided

Presumptive TB Pt. not microbiologically conferred But Aided on CXR/ HPE/ c/f..

FAILURE

Person is SS +ve even at end of Rx.

FOLLOW-UP

Drug sensitive New + Previously Rx

1) SS only at the end of Intensive Phase & Continuation phase

2) If pt is +ve on S.S. at end of Intensive Phase
   a) no need to extend I.P. ~~at~~ By 1 month
   b) Sputum ~~Sputum~~ sent for DST (Drug sensitive TR)

3) Monthly wt

4) CXR. (If required)

DRUG RESISTANT

Sputum smear monthly 3, 4, 5, 6, 7 months. In I.P. & at 3 monthly Interval In C.P. at 9, 12, 15 months.

99 DOTS PROGRAM-

Def^n- Online monitoring of Rx adherence

2) Pilot programme in HIV - TB

3) Each Anti-TB Blister Pack is wrapped in a custom Envelope, & includes hidden phone no. that are visible only when doses are dispensed.

4) After taking medication pt- makes ~~free~~ free call to hidden phone no.

NVBDCP

1> Malaria
2> Filaria
3> Dengue
4> Chikenguniya
5) JE
6> Leishmania

MALARIA -

National Framework for malaria elimination in India (2016 - 2030)

(Aggressive Target 2016 - 2022)

GOAL - Eliminate malaria ['0' Indigenous cases throughout entire country by 2030

CAT	PHASE	STATES/ UTs
0	Prevent of Re-establishment	'0' Indigenous cases of Malaria
1	Elimination	State API < 1/1000
2	Pre-elimination	state API < 1/1000 & some district having API > 1/1000
3	Intensified control	state API > 1/1000

MALARIA CONTROL STRATEGIES : JUNE (malaria control month)

National Dengue Day = 16th May.

1) Surveillance → M_x

2) Case management

3) IVM (Integreated Vector Management)

a) IRS (Indoor Residual Spray)

↳ DDT : Malathion

Mainstay in Rural areas

b) ITN / LLIN → Urban area

c) Anti-Larval (Both the areas)

(2) CASE - M_x :- Non-♀ state

P. vivax P. falciparum.

P. vivax
↓
CQ × 3 days.
+
PQ × 14 days

P. Falciparum
North-Eastern → ACT - AL. [Arthemether + Lumefantrine].
Other states → ACT + SP [Artesunate + sulfadoxine + Pyrimethamine]

Single dose of PQ on Day 2

♀ PQ in C/I

Uncomplicated
- P. vivax → CQ × 3 days
- P. falciparum
  - 1st Trimester → Doc = Quinine
  - 2nd, 3rd Trimester → Doc: area specific ACT

Complicated Falciparum → ACT in all Trimester

MALARIOMETRIC INDICATORS -

1> SPLEEN RATE :- Best indicator of malaria prevalence in community

2> INFANT PARASITE RATE :- Most sensetive index of Recent Transmission in Locality

3> API (Annual Parasite Index) ⇒
API ≥ 2/1000 population → High Risk area

$$API = \frac{\text{confirmed cases During 1 year}}{\text{Population under surveillance}} \times 1000$$

4) ABER [Annual Blood Examⁿ Rate]

$$\frac{\text{NO. of slides examined}}{\text{Population}} \times 100$$

Imp:- Index of operational efficiency

AIM:- To screen 10% of entire population

CHEMOPROPHYLAXIS

< 6wks
(short-term)
↓
Doxycycline (daily)
or
Chloroquine (wkly)

> 6wk.
(LONG TERM)
↓
Mefloquine

JE CONTROL

1) Human Vaccination → Most effective [SA-14-14-2]
0.5mL / S.C. (L) upper arm
Diluent :- Phosphate Buffer

2) VECTOR CONTROL → JE Vector are outdoor resters,
∴ IRS is of no Benefit
a) outdoor spraying
b) Pigs to kept away from human dwelling

FILARIASIS CONTROL

1) Chemoprophylaxis-
DEC + Albendazole single dose annually for 4-6 yrs
Given to all except ♀, children < 2 yrs

2) Chemotherapy -
DEC - 6mg/kg x 12 days
DEC medicated salt ⇒ mass Rx of filariasis.
Consumed for 6-9 months i 1 gm DEC/kg of salt

LEISHMANIASIS

1) LAB Δ :- RDK PK 3g

2) DOC :- Liposomal Amphotericin B (I.V.)

3) alternative ⇒ miltefosin

4) obselete ⇒ Na stibogluconate

5) Financial Compensation →
500/mnth → cases
2000/mnth → PKDL
300/mnth → To 1° worker of pt for Rx
200/~~mnth~~ → Generating awareness in community

67 CONTROL → A) Sandfly Control
(Done By Resedual Insecticide)

a) DDT / 1st choice
2 metre, 2 Rounds / yr.,
@ 2gm / m^2
alternative → BHC

B) Personal Prophylaxis
avoid by sleeping on floor
Fine mesh nets < 0.2 mm

CRS → Health care of community